SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 1910.—Vol. XLII. LONDON, SATURDAY, MARCH 30, 1872. PRICE ..... FIVEPENCE. PER ANNUM, BY POST, £1 4s.

Original Correspondence.

THE SCOTCH IRON TRADE—No. III.

THE MONKLAND IRON AND STEEL WORKS.

This is the name of an establishment situated at Calderbank, about two miles from Airdrie and four from Coatbridge—the centre of the iron trade in the West of Scotland. It is close on 60 years since the foundations of the Monkland Works were laid by two gentleman who are now deceased, and who confined their operations at the outset of their career to the manufacture of steel. From time to time the works were added to, until they actually became too large for the available working capital, and the consequence was that in July, 1861, the proprietors suspended payment. The result was ruinous to the trade of the district. Hundreds of families were reduced to a state of the greatest misery, and the stoppage of such a gigantic concern necessarily involved the bankruptcy of several smaller firms. In course of time, however, matters were so far rectified that the works were recommenced under trustees, and they are now in a most prosperous condition.

The situation of the Monkland Works is romantic in the highest degree. They cover a long narrow strip of ground in a deep gorge, on either side of which precipitous cliffs rise up almost perpendicularly. It is thus impossible to see the works until close upon them. This peculiar *locale* is rendered still more picturesque by the proximity of a rapid tortuous stream, called the Calder, which has its course in the valley, and actually divides the works into two distinct halves. It is from the Calder that the Monkland Canal derives its main source of supply in the winter. During the summer months when the stream is often nearly dry, the canal is fed by an immense reservoir, seven or eight miles eastward from Calderbank, where it emerges into the Calder. A line of rails communicates between the Monkland Works and a spacious quay on the banks of the canal, from whence the iron is conveyed to Glasgow for transhipment to all parts of the world. The company also possess the advantage of railway facilities. About 17 years ago they constructed a line between four and five miles in length, which provides direct communication with the Caledonian Railway on the one hand, and with the North British Railway on the other. The one end of this line terminates at Thankerton Junction, near Holytown; the other terminus is at Brown's Burn, on the North British main line. A viaduct across the valley in which the Monkland Works are situated, and distant only about 50 yards from the works themselves, is the most striking feature of the line. This viaduct has ten arches, the height of the centre arch being upwards of 200 feet.

With reference to the extent of the Monkland Works, we may state that they comprise, in addition to six blast-furnaces, one of the largest establishments in Scotland for the manufacture of bar iron. Five of the blast-furnaces are of the ordinary kind. The sixth furnace is conducted in accordance with a patent taken out about two years ago by Mr. Ferrie, the enterprising manager of the works. Another patent furnace has been in course of construction for some months. It will be blown in shortly. It is intended to alter another of the old furnaces in harmony with the patent. During the last two years Mr. Ferrie's new furnace has been the subject of much controversy and interest among engineers and ironmasters. Its leading features have already been described in the Journal. Briefly we may here explain that it is what is called a self-coking furnace. The fuel is charged in the raw state under an ordinary bell and cone appliance. In this respect it is entirely different from the ordinary furnace, the ordinary practice in iron smelting being to use raw coal only in open-topped furnaces, or if used in the raw state under bell and cone it is done in conjunction with coke. The top is closed by bell and cone. The gases are led to heaters in the usual way. The upper part of the furnace, below the space required for bell and cone, and terminating 20 ft. further down, is divided into four compartments or retorts, by vertical walls, supported on arches, and radiating from the centre. These vertical walls, and also the circumferential walls, are pierced with flues, through which a portion of the gases taken from the top are led as far down the interior as the bottom of the retorts. The gas so conducted, after being mixed with the necessary quantity of atmospheric air, which is admitted by means of gratings placed round the outer stem of the furnace, is ignited, and passes up through and around the flues, being assisted in its passage by stalks attached to the top of the furnace. The economical results of the furnace from first to last have been most satisfactory.

The production of pig-iron at the Monkland Works will average 70,000 tons per annum, and as the brand is now sold at 90s. per ton, it will be apparent that there is an enormous turnover. Some years the production has been as high as 80,000 tons, but this has hitherto been quite exceptional. The annual consumption of coal is fully 180,000 tons; that of lime, 42,000 tons; and that of ironstone, 125,000 tons. These are the exact returns for the year ending Dec. 31 last, made up for the purpose of being laid before a meeting of the trustees held a few days ago. The usual charge used for the blast-furnaces is 16 cwts. of coal and 12 cwts. of ironstone, mixed with 4 cwts. of lime. The company own about 30 pits, which they regularly work for their own purposes. For many years the coal and ironstone were obtained in sufficient quantities in the immediate neighbourhood of the works. Lately, however, in consequence of the gradual exhaustion of the mineral deposits close at hand they were compelled to open up fresh mineral fields in the neighbourhood of Skaterigg, Maryhill, and Bathgate, some of the pits being upwards of 20 miles distant. The bar ironworks, as we have already indicated, are divided into two parts. The oldest portion is situated close to the blast-furnaces, and is known as the "Old Mill." It comprises 25 puddling-furnaces and 2 forge trains, each 17 in. diameter. There is also a train of merchant rolls 16 in. diameter, and another train 8 in. diameter, driven by a high-pressure engine, 40-in. cylinder and 8-ft. stroke. Another engine is used for driving the nail-rod mill, and another train 14 in. diameter, adapted for "slitting" the bars. The smallest bars made are one-eighth by one-sixteenth of an inch. In the other half of the bar-iron works, situated on the other side of the Calder Water, and accessible by several strong bridges, there are 40 puddling-furnaces, but several of them are not in operation just now. This part of the work is called the "Haugh." The furnaces are all of the ordinary kind. A new kind of reversing mill has recently been put up here, which promises to be a great success. Its speciality is that instead of reversing with the ordinary clutch, it is reversed by means of a friction cone. The masters are the Messrs. Stevenson and Company, of Airdrie. Another mill of similar construction is about to be fitted up at the Blochairn Works. The forge-trams at the "Haugh" are 20 in., 18 in., 16 in., and 14 in. respectively. Besides these there is a slit mill for nail-rods. The whole of the machinery is driven by a pair of horizontal engines, of 37½-in. cylinder and 6-ft. stroke, supported by a heavy cast-iron framing. There are two steam-hammers of 50 cwts. and 30 cwts. respectively.

The blast for the pig-iron works is supplied by an atmospheric condensing engine, the blowing-cylinder being 77 in., and the steam-cylinder 42 in. and 8 ft. stroke. There is another pair of coupled-engines, with 70 in. diameter blowing-cylinder and 23½ in. steam-cylinder. A third engine, also used for the blast-furnaces, has a blowing-cylinder 100 in. and a steam-cylinder 36 inches.

About 200 yards from the blast-furnaces there is a brick-work of considerable extent, and a number of kilns for calcining the cinder used for fettling purposes. The total number of men and boys employed by the company is over 3000. This is inclusive of the collieries and the Chapelhall Works, which we shall have occasion to describe in a subsequent article. The amount paid in wages is over 3000*l.* per week. It is worthy of note that the works are very busy at the present time in both the pig-iron and the malleable departments.

IRONWORKS AND COLLIERIES IN YORKSHIRE.

THE MONK BRETTON COLLIERY.

IMPORTANT IMPROVEMENT IN FRICTION CLUTCHES.

In a picturesque, and until recently a charming and secluded spot in South Yorkshire has just been opened one of the best laid out and largest collieries in the Midland coal field. MONK BRETTON, a township rather more than two miles from Barnsley, from which the founder of the present family of Wood, of which Viscount Halifax is the head, originated, contains some very valuable seams of coal, including what is locally known as the "Nine-foot." The greater part of the land at one period belonged to the monks of Bretton, an establishment of the Cluniac order, the original designation of the Abbey being the Priory of St. Mary Magdalene of Lund—the latter term still adhering to a wood in the district—which was dissolved in 1539. Some parts of the Abbey are still in existence, more especially the water mill, the very site, there is every reason to believe, where the monks of the Abbey ground their corn more than 500 years ago. The land, formerly held by the monks, some of which was conveyed to them and their successors on payment "for evermore a rose floure in the fest of nativite of Sent John Baptist iffe it be askyd," is now owned by several proprietors, including the Viscount Halifax.

The coal field embraces an area of nearly 2000 acres, the owners of the colliery being Mr. T. W. Embleton, The Cedars, Methley (President of the Midland Institute of Mining Engineers); Mr. W. Day, Monk Bretton House; Mr. W. Pepper, and Mr. T. M. Carter, Wakefield. Mr. Embleton is known as the principal mining engineer in Yorkshire, whilst Mr. Day is not only an engineer, but also a very large colliery proprietor in the district, so that under the auspices of those two gentlemen it was generally expected that the pits at Monk Bretton would be well and judiciously laid out. The expectations thus formed were more than realised, for at very few places in the kingdom has everything calculated to conduct a large business economically and efficiently, and so as to ensure the comfort and safety of the workmen, been carried out to so great an extent. The colliery may indeed be termed a model one.

The pit bank is raised 30 ft. from the surface, and there are lamps all round it, lighted with gas made on the premises. There is a well-fitted room for the two weighmen, having plenty of light, with a machine by Denison, of Leeds, weighing up to 25 cwts. On the other side of the bank is another room with shelving round, and an iron plate in the centre, heated with gas, for the purpose of not only warming the banksmen and others, but also their tea, &c. The headgearing is 55 ft. from the bank, the uprights and back legs being of massive pitch pine logs, 22 in. in diameter, the pulley wheels being 17 ft. in diameter. The top of the gearing is entirely free from all extraneous material, and has a very fine appearance. The rope is of the ordinary wire description, the cages are single decked two corves, bringing up from 10 to 12 cwts. of coal each at every draw.

There are three shafts, two for drawing and the upcast. At present only one of the drawing shafts is at work, but preparations are being made, by putting up the head gearing, to get the second one ready. The drawing shafts, which are about 8 yards distant from each other, are fully 12 ft. each in diameter, and are tubbed with cast-iron metal in segments to a depth of 140 yards from the surface. The tubbing was put in as the sinking was proceeded with, as a good deal of water was met with. The upcast shaft is 16 ft. in diameter inside the tubbing, which is down about 100 yards from the top.

The drawing engines at present at work were made by Manning and Wardle, of Leeds, and have a little history of their own. They are horizontal, each being of 25-horse power, and of rather peculiar construction. The bed plates are very massive, 10 ft. long, each weighing about 8 tons, being finely planed and finished. The engines, with a second pair, were ordered during the war in America by the Confederate Government for one of their principal sea ports. One pair was sent out, but never reached their destination, having been captured by Northern cruisers; and the war terminating, the second pair did not go out of Yorkshire. We may say that to each engine there are a pair of sliding valves. For underground haulage purposes there are a pair of horizontal engines, by Pigott and Farrar, of Barnsley. There are five boilers, each about 30 ft. long, of the ordinary type, and room has been left for two more.

In the yard there are all the usual shops and sheds for the blacksmiths, carpenters, &c., whilst a small gas apparatus supplies the different places, the offices, &c.

The seam of coal to be worked, the well-known Barnsley, is nearly 9 ft. thick, and distant from the surface 300 yards. In the sinking several other seams were gone through, including the Newhill, Wath Wood, Half-yard, Abdy, Beamshaw, and the Kent Thick and Thin. No doubt when the Barnsley seam and the Silkstone, which underlies it at a distance of about 380 yards, are reached some of the top seams will be gotten, as the Newhill is 3 ft. 7 in. thick, and the lower Kent 5 ft. thick.

At the present time the men are engaged in driving out, but the working will be on the long wall principle when all is ready. A great advantage results from driving out to the extent of the boundary, or nearly so, and working the coal by bringing it back from that point.

When the two drawing pits and gearing are all completed, and the colliery in full working, something like 1600 tons of coal will be drawn out daily. The works are advantageously laid out for the removal of the coal, the Midland Railway running close to the colliery on one side, and the canal on the other.

A large number of bricks are made on the ground from the bind brought out of the pits—the bricks being far superior to those made of ordinary clay. There is a kiln, with an extensive drying shed, and a brick-making machine, patented by Schofield, and made by Fawcett and Shackleton, of Leeds, by which 6000 can be turned out daily.

In connection with and forming part of the machinery for hauling and working the inclines in the pit a novel arrangement of Friction Clutch is adopted. It has been invented by Mr. Gillot, patentee of a new coal-cutting machine, and has been manufactured by Messrs. Pigott and Farrar, of Barnsley. It consists in forming in the inner side of the brake, which is firmly secured to the drum, an angular, or V-shaped, groove, into which a number of segments are fitted, one end of each segment resting on a short link, which connects that end with a set of arms keyed on the drum shaft. The other end of the segment is supported by the short end of an L lever, corresponding in length to the before-named link, and connecting it also with the set of arms. The long leg of the lever projects between the arms, and is furnished at the end with a swivel joint, by which a connecting rod, to which is attached a regulating box, connects that lever with a radial link. It works on a swivel joint formed on the boss of the arms, thus admitting of motion at right angles with the arms, and in a line with the shaft on which the arms are keyed. A short coupling link is connected to the top of the radial link and to a boss which slides freely along the shaft, and is operated upon by a forked lever, after the manner of the ordinary clutch. When the sliding boss is pushed towards the arms the radial link and connecting rod are brought into a straight line, and pushes the long end of the L lever up, thus bringing the segments into contact with the brake ring, and communicating the motion of the arms to the drum, which runs freely on the shaft. So powerful is the bite that it can be made to bring the engines to a stand before it will slip; or it can be regulated so that a slight increase of the load will cause it to slip, thus preventing the wholesale breakage which not unfrequently occurs with the ordinary gear. It can also be attached or detached with the greatest ease, when the machinery is at its highest speed, without producing any shock whatever. The clutch has been highly approved of by those who have seen it in operation, and there is every reason to believe that its success at Monk Bretton Colliery will lead to its soon being adopted at many others throughout the country. We hope to be able to give a drawing of the invention at some future time, which will show at once the advantages of the new arrangement of the clutch such as we have endeavoured to describe.

MINES REGULATION BILL.

CERTIFICATED MANAGERS.

The Bill is not at all clear as to who or what class of person is intended to fill the position of manager, but from the general opinion on the matter I gather that the individual contemplated in the Bill is the underviewer of the North of England (or the overman when there is not an underviewer), who corresponds to the head overlooker, or head underlooker, or head underground bailiff, or underground manager, &c., of other districts.

I think that if these are the persons meant there could not be committed against any set of men a greater act of injustice. An accident from the want of timber takes place—Who orders the timber? certainly not the overman. Many accidents might happen from causes or deficiencies over which such a "manager" could not have the least control, and once let a general antagonism of interest be established between such "managers" and those above them, and there is an end to any "management or control" whatever. But suppose it is a clear case of inadvertence on the part of the overmanmanager, and a fatal accident occurs, and the certificate of the "manager" is taken from him, who is to occupy his place? It has probably taken him years to obtain the practical knowledge which has procured him his situation, and perhaps he is the only man living who, from his perfect knowledge of the colliery under his care, is able to conduct it safely. Is the colliery to be stopped altogether to prevent future accident, or is it to be conducted with less safeguard against future accident, by the substitution of a man who can pass an examination, but who knows nothing whatever of the condition of the colliery he is called on to manage? It may be said that underviewers and overmen *are* changed at present, but there is always (except in most rare cases) sufficient time to prepare a successor to the person who retires. The suspension contemplated in the Bill would be instant.

The argument of the similarity between the case of certificates to colliery managers and ship captains has been completely refuted; but if overmen are to be the certificated managers the comparison falls still further to the ground, because it is not necessary that second mates should be certificated, nor so far as I know, first mates either. If, however, the Bill means that the viewers of collieries are to be the certificated managers, I think that there will result a very inferior class of viewers to those who are at present engaged in the profession, unless the Government employs and pays those who, having served a due apprenticeship, will still be unable for a few years to obtain situations, that difficulty, already in existence, being largely increased if the certificate clauses become law. From such a class a very superior class of sub-Inspectors could be obtained, who, after three or four years' practice, would form, probably, most able and efficient viewers of collieries. But even with such an arrangement it would, I think, be extremely doubtful if any of the class of existing viewers that could possibly do otherwise would continue to hold offices where such a condemnation, as the withdrawal of the certificate would in all likelihood amount to the confiscation of the office, and the ruin of

its holder; and if this were to be the result, who would teach the aspirants? G.

PUBLIC HEALTH BILL.

SIR,—Not having observed in the *Mining Journal* any notice of this Bill (introduced Feb., 1872) as affecting the mining interest, I beg to draw attention to the 32nd and 33rd clauses, in the latter whereof penalties are attached against any person causing or permitting to flow into any stream any filthy or noxious water or washings of manufactories or other polluting liquid. And among other liquids therein declared to be deemed polluting is (3) "Any liquid which exibits by daylight a distinct colour when a stratum of it 1 in. deep is placed in a white porcelain or earthenware vessel."

Assuming that the dressing of the crude ores brought from mines into a merchantable condition may be considered a manufacture, I apprehend that the waters flowing therefrom, and more especially from the dressing-floors in the North of England, where the minerals are chiefly obtained from transition rocks, cannot stand such a test as that above quoted; besides which it may be observed that discolorisation of a liquid is no criterion of its objectionable impurity.

The other tests of pollution given in the same clauses seem to cover every offence, and the special qualities and quantities of polluting matter therein defined offered an opportunity of fairly grappling with them. Whilst this porcelain test must prove not only illusory, but so far as it applies to ore-dressing waters sadly, and it is submitted needlessly, interfering with an important national interest.

March 27. A NORTH COUNTRY READER.

SMOKE NUISANCE VERSUS BAKERS' OVENS.

SIR,—A great outcry is just now being raised by a large body of London bakers against the operations of the Smoke Nuisance Prevention Act, and they publicly declare their belief that such furnaces as they employ should be exempt from coming under its operations, consequently that they are subjected to penalties that are most unjustly imposed on them. From my large experience on this subject for 20 years, commencing in 1840, I beg to offer a few observations on this matter bearing a practical character.

Manufacturers, however great or small, do not study public comfort and convenience in the conducting of any business, be it as offensive as it may, unless their so doing can be made a source of economy. Now, smoke prevention, vulgarly called "smoke burning," is, theoretically, a source of economy; yet practically it is often attended with expense from extra labour, because much rests with the stoker, even after the most approved furnace has been set up. It is evident that the same fireman can as easily attend to two, three, or more fires as to a single one, and to the burning of several tons of coal with nearly the ease required for only a few hundredweights. Here, then, is the principal difficulty of the matter as concerns bakers. They have seldom any stoker at all; their fireman has many other occupations, and if he must give any express attention to the fire he must probably neglect other claims on his assiduity. It is clear, therefore, that little or no saving is to be obtained from the careful and watchful attention to one furnace, burning only from one to two or three hundredweights of coal, requiring more or less care to keep it from pouring forth dense volumes of smoke from the chimney.

The bakers' furnace is small, but being closed at front and all round, except at the back, it prevents many of the required advantages for successful smoke prevention; very different from that of an open domestic, or even a smiths', fire. It has but a short flue, which would be all the better if it were longer, both for heating purposes as likewise for promoting perfect combustion. This flue enters the cavern-like oven, in which heat, and not smoke, is mainly wanted. As the fire is, at most, only lighted once or twice a day, it is then principally that the really objectionable black smoke is made; and, though the time occupied may be only a quarter of an hour, that is quite sufficient to prove a serious source of inconvenience to any respectable neighbourhood. The bakers, on their own behalf, declare that the smoke is only equal to a few domestic fires, and imagine that this must be endured, because it is one of those necessary consequences of bread-baking that cannot be cured.

Now, to show the fallacy of any such representations, I would observe that attention to the following suggestions will obviate every difficulty, and such attention will be better on the part of the bakers than any false reasoning:—

1.—Observe that a long-flued furnace is better than a short one; but, having any flue at all, there must be a draught through the furnace, which is *sine qua non* in smoke prevention.

2.—Where there is only a very sluggish draught this may be aided by affixing a small circular blower, to act above or below the grate, and which could be occasionally operated by hand for five or ten minutes after lighting the fire.

3.—Air must be admitted through perforations of ¼ to 1 in. in the brick or iron work, spread over the sides, top, or front, with means of closing them when combustion is complete. And—

4.—The commonest furnace may be managed so as to give off no offensive smoke by adopting slow combustion, lighting early, and rather at the back, or top, of the fuel in preference to the front, beginning with anthracite coal, or coke, then pushing this forward as it becomes incandescent, and adding the fresh fuel in front, on or near the dead-plate, and *not* on the top or behind the burning fuel. But—

5.—To make smoke, observe to fill the furnace with a mixture of small and large lumps of Newcastle coal, with plenty of firewood, which should only be lighted at the very last moment, and well poked, carefully excluding all air except what can struggle in at the fire-bars, or any cracks or crevices.

A certain remedy, next to mechanical aids, is the giving of a perquisite of two or three shillings per week or month for attention on the part of the man acting the part of the stoker, making deductions for neglect, and imposing a fine should penalties be incurred.

Furnival's Inn, Holborn, March 27. HENRY DIRCKS, C.E.

IRON SHIPBUILDING IN THE UNITED STATES.

SIR,—The article in last week's Journal on Iron Shipbuilding in the United States, is very interesting; but the writer falls into an error, common with Europeans, when he mistakes the views of a State for those of the whole country. At home we are a sectional people, having sectional interests and sectional views. Since the civil war the country is more centralised, and is consequently a stronger Government than before, when every State, large or petty, was constantly prating about its rights. Pennsylvania was an old pet, and as she usually voted with the dominant party, claimed a protective tariff for her coal and iron. Her views are very selfish and narrow-minded compared with the views of New York, Massachusetts, or California; she even goes so far as to prohibit trade within her limits by the citizens of other States without the payment of heavy taxes, and even then her merchants often refuse to buy of any other than a Pennsylvania house, although they will acknowledge that they will have to pay more for the same article.

The American Steamship Company is, as you tell us, the creation of the Pennsylvania Railway Company, which wishes to compete with New York for the immense freight from Europe for the West, and for which they have excellent carrying capacity. At present this carrying trade is done principally by the Erie and New York Central Railways. With Philadelphia as a terminus for the new line, all the freight they obtain must go by their railway. To make the enterprise a popular one with the people of Pennsylvania, they proposed to build the line in Philadelphia; this, notwithstanding the fact that the Clyde builders put in proposals offering to build the vessels for much less than they could be constructed in the United States. The Cunard, French, Inman, and other excellent lines plying between New York and Liverpool are all Clyde built, and it is a generally acknowledged fact in America that we cannot compete in price successfully in shipbuilding with English builders. The Collins' line was heavily subsidised by Congress to keep up, if possible, an American line of steamers. But being built cheaply, they were lost one after another at sea, and the idea of keeping up a line almost entirely at the expense of Government was abandoned. The Philadelphia Company may succeed, as they cannot expect a Government subsidy, and therefore will build strong, seaworthy vessels, but their success will only arise from their connection with the railway company. The tedious, difficult, and at times dangerous navigation of the Delaware River will be serious obstacles to their success, but at all events the railway will benefit by whatever frieght they carry, and as it is a Pennsylvania line, the Pennsylvanians will feel in duty bound to patronise it in preference to the New York steamers, even if they are a week longer on the passage. Boston, which fought New York for awhile for the carrying trade, looks on at the Philadelphia experiment, smiles to herself, and says, an ounce of experience is worth a pound of theory. Americans, as a people, when it comes to the pocket, are not so narrow-minded as not to recognise facts; and the fact is well established that we can get good vessels, either of iron or wood, cheaper in England than we can build them at home. The Pennsylvania Company is an exceptional case, for the reasons assigned above, and I, therefore, hold that your strictures, though applicable to that State, do not apply to the country generally.—*March* 24. M. J. RYAN.

TIN DRESSING—CLASSIFICATION OF STUFF.

SIR,—Your correspondent, Mr. Green, in his letter of the 19th inst., states that he has secured the principle of classification by means of several patents. It may be useful to some of your readers to know that no one can secure a principle by Letters Patent. He might as well seek to secure the monopoly of any of the laws of Nature—as, for instance, the principle that minerals of equal volumes and densities have equal velocities of fall in water.

Seeing that Mr. Green claims the "principle" of classification, he will, if he is prepared to defend such a claim, give your readers the number and date of his several specifications, and describe what he claims as being really *novel* in his inventions. SCEPTIC.

March 25.

REVENUE AND EXPENDITURE, AND ENGLAND'S MINERAL WEALTH.

SIR,—The total amount of the National Debt is 792,740,000*l.*, and the annual charge to the community is 26,830,000*l.* The income tax yields 166,000*l.* upon 1*d.* in 1*l.*, or (say) 400,000,000*l.* revenue; and, as the income of the United Kingdom is estimated to reach the enormous sum of 1,000,000,000*l.* annually, it follows that the income tax is only paid on two-fifths of the earnings of her Majesty's subjects. The indebtedness of the country will in time be reduced 55,757,000*l.* through terminable annuities. Mr. Lowe states that since April, 1869, the National Debt has been reduced 12,740,000*l.*, notwithstanding an increased expenditure of 10,000,000*l.* in the purchase of telegraphs, fortifications, abolition of purchase, and the war in Europe.

The Government have in their hands the post office, packet service, and the telegraphs. These three, or rather two, branches of trade show the following results:—Revenue, 5,620,000*l.*; expenditure, 4,245,000*l.*; profit, 1,375,000*l.* Nothing can possibly work better than the post-office and telegraphs under imperial control, and if the Government can make a profit of 32½ per cent. on an expenditure of 4,245,000*l.* in these two services, what would be the gains to the nation if our railways were purchased up by the Government, which can command any amount of capital at 3 per cent.; and who can estimate the effects of 550,000,000*l.* sterling, now invested in railways, being returned to the various proprietories of stocks and shares, and seeking employment in other channels? That this course will ultimately become the policy of a Liberal Government to advocate and see carried out there can be no manner of doubt or question entertained, whilst in well-informed circles, and especially among actuaries and enlightened economists, it is computed that with important and extending advantages to the public a surplus profit would accrue to the Government, after paying the interest on the purchase-money and the costs of maintenance and working charges, of at least 26,830,000*l.*, the gross interest now paid annually on our National Debt of 792,740,000*l.* The direct taxes amount to 12,300,000*l.*, of which the sum of 9,950,000*l.* is income tax. The costs of the army is estimated at 14,824,000*l.*, and that of the navy 9,508,000*l.*; together 24,332,000*l.* What have we got for this annual expenditure? It is estimated that a further sum of 853,000*l.* will be required for abolition of purchase during the coming year. Dropping the charges on the National Debt 26,830,000*l.*, and the army and the navy, which costs 25,185,000*l.* annually, Mr. Lowe only requires the further sum of 15,053,000*l.* to meet all the expenditure for the year 1872-3—1,780,000*l.* Consolidateed Fund, 10,652,000*l.* Civil Service, and 2,621,000*l.* Revenue Department—*i.e.*, costs of collecting and administering the 74,915,000*l.*, which Mr. Lowe estimates the revenue will become for the ensuing year, unless the House rebate some portion of existing taxation.

The expenditure for the year 1872-3 is computed as follows:—

Charges for the Debt 792,740,000*l.*		£26,830,000
Army and Navy and Abolition of Purchase		25,185,000
Consolidated Fund Charges		1,780,000
Civil Service	£10,652,000	13,273,000
Revenue Department	2,621,000	
		£67,068,000

	Revenue.	Expenditure.	
Post Office	£4,770,000	£2,610,000	
Telegraphs	850,000	500,000	
Packet Service	—	1,135,000	
	£5,620,000	£4,245,000	4,245,000
Total			£71,313,000

It is a remarkable feature in raising the revenue of this country that only 17½ per cent. springs from direct taxation, including the unpopular income tax, yet we hear of more dissension in the House of Commons about saving 1,000,000*l.* a year than is raised throughout the country consequent on the enormous taxation for poor rates, paving, sewerage, police, lighting, and numerous other purposes both metropolitan and provincial, and in many instances of no practical good or advantage to those who are mulcted of the rates, yet in the aggregate these amount to more than 200,000,000*l.* annually, and are enforced and collected in an arbitrary and frequently cruel manner, while they partake wholly of a direct instead of an indirect impost, at total variance with the national income, 82½ per cent. of which being indirectly raised from the Customs, Excise, stamps, and miscellaneous duties. It is further stated that not more than 4*s.* in 1*l.* is received by the destitute poor from the poor rates collected, and less than 10*s.* in 1*l.* applied in a practical form of the other taxes to which resident householders are bound to respond.

Pray, Sir, allow me to ask to what source of revenue is England most indebted for its power, affluence, and wide-spread influence—politically, commercially, morally and intellectually—both as a nation and a school of industry? I reply, first and foremost in the ranks stand the mineral products of the country. In this respect England is the cornucopia of the world. She possesses mines of coal and of iron that supply fuel and metal to cover the seas with steam-ships and the world with rails for its existing and growing locomotion. The south-west cape of England yields tin in abundance, and supplies the greater part of the Old and New Continents with their requirements. Copper and lead are also found in bulk, and vast are the fortunes that are being and have been acquired from the working of mines for all of these products during the present century, whilst from existing appearances there are no signs of even approaching exhaustion. There are no strata too hard or difficulty too severe to be overcome, no deposit of ore too hidden or obscurely formed in the earth to remain long undiscovered under the searching eye and vigilant industy of the persevering miner. Again, where can such prizes be referred to as Cornwall produces in her tin mines. Dolcoath, Tincroft, Cook's Kitchen, and Carn Brea were worked by the Druids years before the invasion of England by William the Conqueror, and from every evidence they will be profitably worked for centuries to come. Great Vor was a rich mine early in the present century, whilst Levant, St. Ives Consols, and Botallack were discovered 50 years ago, and are likely to exist for 50 years to come. There are also many progressive mines well worthy attention, and it is from such often spring the great prizes that enrich the fortunate proprietors, whilst they engross the attention not only of capitalists, but also of the scientific and philosophical world. It is the mineral wealth of Great Britain that makes her first and foremost amongst the nations of the world, and it is the mineral wealth of her colonies that render them so prosperous and progressive. There is a spring and elasticity about Australia, New Zealand, and Canada that agriculture could not enjender, and though rich in their metallic stores there is no fear that the Mother country will suffer from any competition in her marts for home products, however extended may become the yield of her colonies, whilst trade and commerce advance with every 1*l.* added to the coffers of the latter.

R. TREDINNICK,
Consulting Mining Engineer.

3, *Crown-court, Threadneedle-street, City, March* 28.

LEAD MINING IN WALES—TANKERVILLE.

SIR,—Having received your valuable Journal weekly for many years it has afforded me the pleasant opportunity of knowing the progress and prospects of the various mines, I may say all over the world. Amongst the various countries I notice Wales stands most prominently for the production of lead—for instance, Van and Tankerville. Talking of 15 to 20, and even 30 to 32 tons per fathom, is almost beyond any former record of mines from lodes of regularity. It appears Tankerville is returning about 100 tons fortnightly, 200 tons per month, but until lately only about 150 tons per month; judging, however, from the agent's report, he must be raising yet considerably more than he is sending to market, provided his miners earn about the same amount of wages as I learn the miners do now in Cornwall, and that the same is earned from the contracts reported. I believe, if there is any difference, miners in Wales earn the most—at least, it has been the case generally. For reference as to the amount of lead raised per month, allow me to call your attention to the agent's report in the Journal of the 10th inst., and also allowing his miners to earn about an average of 4*l.* per month: 12 men sinking Watson's engine-shaft, allowing (say) 12*l.* for mining cost—powder, candles, fuse, steel, &c.—must make a charge of 60*l.* to give themselves 4*l.* per month each. To do this at 20*l.* per fathom they must, of course, sink 3 fms.: 3 fms. in a shaft (say) 12 ft. by 9 ft. length and breadth, measures 9 cubical fathoms; this at 20 tons per fathom is 180 tons, which Watson's shaft should yield in one month. The 120 fm. level east, by allowing 8*l.* for mining cost for six men, should be driven 2 fms., at 16*l.* per fathom, to give the men 4*l.* each; 2 fms. at 15 tons to the fathom is 30 tons. Back of the 120 fm. level west should be stoped 4 fms to give six men the same wages, after deducting 8*l.* for mining cost; 4 fathoms at 20 tons per fathom is 80 tons. Back of the 110 fm. level east should be stoped 4 fms. after the same manner, which at 5 tons per fathom is 20 tons. Stope east of winze (say) 4 fms., worth 3 tons per fathom, is 12 tons. The back of the 100 fm. level, west of winze (say) 4 fms., worth 5 tons per fathom, is 20 tons. In the 100 fm. level east of winze (say) 4 fms., worth 3 tons per fathom, is 12 tons—which in the aggregate amounts to 354 tons. If I mistake not, by the agent's reports such has been the yield for several months; whilst, as I have said, the returns of the whole mine have been raised simply from 150 to 200 tons a month. Accordingly there is a large deficiency somewhere, which no doubt the agent can very easily explain, thus relieving the stockholders of a very uneasy feeling. We cannot suppose he has a store on the mine to lay by the surplus of 154 tons a month against a rainy day, as the price of lead is too tempting just now; and there may come a reaction in its value, and the quantity produced, some future day. ONE INDIRECTLY INTERESTED.

Houghton, Michigan, U.S., March 4.

OLD TREBURGETT MINING COMPANY.

SIR,—Permit me to ask the directors of Old Treburgett Silver and Lead Mining Company, through the medium of the Journal, whether they have any answer to make to the charges brought against them contained in the letter of the late secretary, which appeared in the *Mining Journal* of March 9? I feel anxious—having increased my shares in this company entirely on the reports of Capt. Hancock and that of the directors of Feb. 15 and 28 respectively—to see some reply. Surely our directors, and especially our Chairman, will not much longer withhold an explanation, and clear themselves of suspicion which now (through Mr. Tilly's letter) attaches to them.

I extract from Mr. Tilly's published letter, above-referred to, the following:—"Resolved that Mr. Wilson's offer to lend 750*l.* for three months, in consideration of his being appointed the secretary of the company, be accepted, at a salary not exceeding 100*l.* a-year.—Resolved that a legal lien be given to Mr. F. R. Wilson upon the engines and plant at the mine." Mr. Tilly tells us his salary was 50*l.* per annum, yet the directors "dispense with his services" on account of the "financial circumstances" of the company, and yet these "financial circumstances" admit of a salary double that amount being given to Mr. Wilson. My opinion is the latter salary is quite little enough, but mark the logic employed!

Mr. Tilly further states that "175*l.* received on mortgage went into the directors own pockets"—that the "hard-earned savings" (referring to the shares taken by the working miners) "have not gone into the funds of the company, but into the pockets of that gentleman" (the Chairman). Again, Mr. Tilly says he pointed out to the Chairman that his statements in the report of 1870 were "very misleading," and that he replied, "Well, never mind, it got the money." also, Mr. Tilly adds, "I should have been very sorry to have issued a balance-sheet while my share books did not agree with my capital account, as it could not have done at the time this balance-sheet was circulated."

I will add that I know nothing of Mr. Tilly only from his letter above referred to; and as long as these statements remain unrefuted, I for one can feel no confidence in the management.—*Stafford, March* 26. F. A. BIGNELL.

"WHAT TO SELECT—WHAT TO AVOID"—No. XV.

SIR,—I have received a large number of communications from different parts of the country, which clearly prove that the vicious system of fictitious circulars is much more general than I had anticipated. I fully agree with your correspondent who wrote in last week's Journal that "this evil is sapping the otherwise healthy vitality of mining." I will not trouble you with even an outline of the many serious complaints which have reached me, but will content myself by quoting the following, which may be accepted as a fair representative of the whole:—

—— *Rectory, Ireland, March* 18.—DEAR SIR: I have read with pleasure your very able articles, "What to Select—What to Avoid," in the *Mining Journal*; and it might have been to my interest could I have read sooner No. XIV. of the series, in which you touch on "Circular Mining." As an illustration of the ground on which you justly protest against circulars purporting to emanate from different firms which in reality are leagued together as one, I can give you a case in point:—

1.—A circular was sent to me, dated Jan. 13, 1872, signed ——, setting forth —— as one of the best mines in Wales; reserves of ore amounting to 380,000*l.*, and offering 30*l.* shares, fully paid, at 35*l.* each, giving but three days to consider the merits—Thursday, Jan. 18, being the last day to receive applications.

2.—The next circular came on Feb. 10, asking 10*l.* premium, and limiting the time of applications again to three or four days, holding out as the probable result a rise to 200*l.* per share.

3.—The third circular reaches me immediately after, and appeared to come from a new hand, ——, who went so far as to say "—— is considered to be the great mine of 1872." This party offers to sell at par, and only gives two or three days in which to apply.

Finding, as I thought, so many independent testimonies in favour of this mine, I applied to —— for five shares, and had to pay him 17*s.* 6*d.* extra, or 150*l.* 17*s.* 6*d.* (15*s.* being for stamp, and 2*s.* 6*d.* for fee). But what was my surprise when the transfer forwarded to me for signature gave Mr. —— as the seller? But this is not all. The shares were scarcely sold when a prospectus (which these parties were endeavouring to anticipate) was issued, offering the shares for subscription to the public (of course, at par), and the transfer, which was lodged in the office of the company, with the secretary, was followed by a letter to me from him acknowledging the receipt of the transfer, and adding "the certificate, which is waiting the signature of the directors will be forwarded in a few days. (Signed) —— Secretary."

It appears that this office is in Mr. —— house, and, although the above letter was dated Feb. 26, no certificate has reached me yet, which is the more strange since two of the directors live in London. The prospectus gives Mr. —— 700 shares, and only 300 were to be taken by subscription. But, from the course adopted for Mr. —— shares, I fear little capital can be got from subscribers.

4.—The fourth circular is dated March 12, offering to sell —— shares at 3*l.*, and no application can be received after the 16th inst. This is from ——, Fenchurch-street. Perhaps I am not going to get a certificate at all. What to do under such circumstances I know out, as I fear the mine is not conducted for the benefit of the shareholders. Its situation may be good, but why proceedings of the kind? I have written to three of the directors, but they have not answered, and surely —— sales are damaging the company at the time that it wanted funds from the public.

Surely the above is sufficient evidence of the pernicious effects resulting from this unsound system to cause each advocate of legitimate mining to step forward, and fearlessly attack the foe which is doing such an immense amount of irreparable mischief.

Among the mines to which I would expressly direct attention just now is GREAT WHEAL VOR, which is opening out most satisfactorily, and especially in the western portion of the mine, where, many fathoms west of Edwards's shaft—which as I have pointed out upon previous occasions is the most important portion of the property—a lode is being developed of the value of over 100*l.* per fm. Although the accounts at the meeting on Wednesday were scarcely so favourable as those submitted three months since, the fact is more than sufficiently explained by the additional cost occasioned by the heavy floods and increased price of materials. Comparing this great mine

with others at present before the public, its shares at current quotations well deserve immediate attention.

NEW LOVELL is a mine that will from merits alone assume a prominent position at no distant date. The present aggregate value of the different points of operation assure its success, while the point to be attained in depth, which is looked upon by all practical men as one of its most favourable features, cannot fail to add materially to its value. The mine is most ably managed, and the financial executive is all that can be desired. There are only 4096 shares, and with the improving condition of the tin market it may be fairly assumed that the shares will command a much higher marketable value. The district has produced some of the most productive tin mines in Cornwall.

Among lead mines, my information from PENNERLEY tends to establish my previously expressed opinion that this is one of the cheapest shares at present before the public. The market price is positively fully represented by the value of the ore actually discovered, and the reserves of ore are being increased at the rate of between 2500*l.* and 3000*l.* per month. Profitable results are already being realised, and the developments confirm the belief that it will in time prove of equal value to its adjoining neighbour, Tankerville.

FREDK. WM. MANSELL.

Pinner's-hall, Old Broad-street, E.C., March 27.

PROFESSOR SMYTH'S LECTURES AT THE ROYAL SCHOOL OF MINES.

SIR,—In the Supplement to the *Mining Journal* of March 23 you publish a letter from Mr. Knapp, containing some criticisms on the Lectures on Mining delivered by Mr. W. W. Smyth, at the Royal School of Mines. Your correspondent finds fault with Mr. Smyth, in being too hasty in the assumption of theoretical generalisations. Now, Sir, if there is one point on which more than on any other Mr. Smyth insists it is on the uselessness of theoretical knowledge when unaccompanied by that knowledge of detail only to be obtained by long experience. Mr. Knapp quotes as instances in point certain rules given by Mr. Smyth for finding a vein that has been lost on the intersection of a cross-course or throw. These rules are misquoted and misinterpreted. In fact, Mr. Smyth only gives one rule, and this is a simple deduction from the well-known fact that when the walls of a fissure, whether it be vein, cross-course, or fault, have slid upon one another, in the large majority of cases it has been the hanging wall that has slid down upon the footwall. To find the consequences of this physical fact when we are considering the throwing of one vein by another *in place*, is a simple problem in solid geometry, and lands us in the following rule :—"Where the lode is cut by the cross-course, erect a perpendicular; on whichever side of the line of intersection this perpendicular lies, on that side search for the lode."

Now, this is a great improvement on the old Cornish rules of the greater and lesser angle, being true in a much larger percentage of cases; and if the "specious, not to say pretentious," theorists of England and Germany had never done anything more than work out this little problem they would still have deserved the thanks of the practical miner.

AN ASSOCIATE OF THE ROYAL SCHOOL OF MINES.

March 26.

COPPER MINING ON LAKE SUPERIOR.

SIR,—The Americans seem to be a very excitable set, hence the condition of mining on Lake Superior for the past 20 years. There are mines here which by a small outlay of capital could be brought into a profitable state, paying from 15 to 30 per cent. profit; but the companies carried on their works under such outrageous management, putting up piles of useless machinery and buildings, and opening their mines in such a wretched way, that they could not possibly make them pay. And, notwithstanding the very favourable appearance of many of them, the companies seem to entertain the idea that they cannot be made to pay, judging from their past management. Yet I suppose, from the very favourable position of the copper market, some of them will be induced to make further trials. I should be most happy to see an English company take hold here, and see what can be done under good, sound management. Some time since the Douglass Houghton mining property was bought by gentlemen in Chicago, who would have gone into mining here in earnest, and doubtless would have run a railroad through the mineral region; but, unfortunately, they were put on one of the worst locations for making a mine as possibly could be. They put up a steam-stamps where they had ample water-power, put up hoisting engine, &c., and were told they would have a paying mine at such a time, and previously that so much copper per month would be realised; but the truth of the matter was so different that they got quite disgusted, and sold the machinery and stamps for a mere trifle. But there are half a dozen mines in Ontonagon which with from $10,000 to $50,000 more outlay could be brought into a sound dividend state, paying 15 to 30 per cent. profit.

HABITAT.

ST. JOHN DEL REY.

SIR,—On the 7th inst. I addressed you upon the subject of the New Shafts. My letter contained a challenge to another of your correspondents to name one practical man of reputation who holds his opinion respecting them. You were good enough to insert it in the Journal of the 16th. On the 23rd he replied to the effect that he disliked my style; so do I, sir, although it is my best, but that is no answer to my challenge published on the 16th inst., which, with your permission, I now repeat to "Another Shareholder"—to give the name of one practical man of reputation who holds the opinion that the shafts are sunk in the wrong place. If this fails to get it out of him, I will not further occupy either your valuable space or my time with him or his opinions.

The recent heavy fall in our shares is altogether apart from the shafts; that they are in the right place shareholders are (notwithstanding these attempts to frighten them) perfectly SATISFIED.

Dalston, March 25.

[For remainder of Original Correspondence see to-day's Journal.]

IMPROVEMENTS IN THE GENERATION OF STEAM.—In order to effect the more rapid and economical generation of steam, Messrs. COLLINGRIDGE and STEPHEN, of Dunkerque, propose to use a small closed vessel constructed of copper or malleable iron, or other suitable material of sufficient strength to resist a pressure of at least two atmospheres, such vessel being furnished with two tubes or pipes, one end of each pipe communicating with the interior of the vessel. Each pipe is fitted with a self-acting valve, so constructed to operate that the valve of one pipe allows fluid to flow inwards only into the interior of the closed vessel, and that the valve of the other pipe allows of the liquid when greatly dilated with heat or converted into steam to flow outwards only. To work the apparatus, the closed vessel should be charged with a small portion of fluid analogous to the main body of fluid requiring to be heated or converted into steam, the cover fixed securely on the pipes so arranged that the orifices of the extremities furthest from the vessel lead into the main body of fluid, penetrating deep below the surface. Active heat being applied to the exterior of the closed vessel, steam is rapidly generated, and escapes into the main body of fluid through the pipe, with the valve opening outwards. The immediate result is the formation of a vacuum inside the vessel. This vacuum in its turn is quickly filled by an influx of a portion of the main body of fluid, which rushes in with extreme velocity through the pipe, with the valve opening inwards only. This portion of fluid is converted into steam, and escapes in that form as before, leaving a vacuum again to be re-filled from the main body.

HOMOGENEOUS CAST-STEEL AT ONE OPERATION.—The novelty which constitutes the invention of Mr. L. VIGER, of Montreal, Canada, is the use of the admixture in predetermined and definite proportions of pulverised plumbago, anthracite, charcoal, bituminous coal, coked or in the natural state, compressed or not, with pulverised iron ores, oxides, or carbonate of iron, iron-sand, or wrought-iron, iron scraps, shavings, clips, and sponge, and metallic iron of any description, in a crucible or reverberatory furnace, or re-heating or puddling or air-furnace, or with what is known as a Siemens' furnace, or in any other furnace heated by gas, to make cast-steel of any desired quality in one operation. The mixture, if used in a furnace, to be covered or not with a flux of glass or blast-furnace cinders, or with glass-making materials, slabs of soapstone, tiles, bricks, or any other covering, and if the ore or carbon used contains earthy matter, the slag scoriæ which they will furnish may render other coverings unnecessary. In a furnace heated by gas if a neutral flame, neither oxidising or carburising, can be produced, no covering is required. The above admixture to be used in the following proportions—from two-tenths of 1 per cent. to 30 per cent., and even 40 per cent. of said carbon in weight of the ore used, or of the oxide of iron, or carbonate of iron, according to the purity of the oxide or carbonate of iron, and of the carbon used, and according to the quality of the cast-steel to be produced. The above admixture, either loose or compressed, with a coating of plumbago or other carbonaceous matters, and covered or not with the above-mentioned coverings. To the admixture may be added a small quantity of oxide of manganese, lime, and fluate of lime, in equal proportions, wood, tar, or common glue may be added in compressing. To insure uniformity, the ores and carbons used should be free from all impurities, finely pulverised, thoroughly and uniformly mixed, and when weighed must be dry, and sufficient carbon added to ensure the carburising of the ores to the required degree,

HYDRO-PNEUMATIC ENGINES AND HAMMERS.—The feature of novelty which constitutes the invention of Mr. W. MILLER, of Glasgow, is the arrangement of a pair or several pairs of tanks, placed one above the other, from which the combined action of air or gas and water is by suitable appliances conducted to and caused to actuate the hammers or engines.

IRON AND STEEL INSTITUTE.

[Concluded from last week's Journal.]

Mr. SNELUS then read his supplementary report "On the Danks Puddling Process." This is claimed to be a complete report upon the scientific aspects of the process. He refers more particularly to the question whether silicon is capable of reducing oxide of iron to the metallic state, what proportion of silicon, sulphur, and phosphorus usually shown in analyses of puddled bars and like products is really combined with the iron, and whether any or all of this will pass into combination with iron when the puddled bar is melted either alone or with a certain proportion of pig-iron. The consumption of fuel in Danks's furnace is very great, but as it takes 30 to 50 minutes to melt the charge of 600 lbs., while half-an-hour suffices to puddle it, it is suggested that the melting of the iron should be effected in another vessel. By this means, he says, nearly half the fuel could be saved, and twice the number of heats obtained in the same time. He then gives a general outline of the process. White pig-iron gave an inferior yield to grey. The higher the temperature at which the furnace was worked the better was the yield. The improved yield appears to result from the quantity of iron taken up from the fettling, and the fettling used being very pure.

Mr. RILEY thought the paper too long (it forms a pamphlet of 28 pages) to discuss upon merely hearing it read. He had been led to suppose that silicon, sulphur, and phosphorus had a deleterious effect on iron, but recent experiments had caused him to alter that opinion. He had put as much as 22 per cent. of silicon into iron, and he had found that you could get beautifully working steel containing as much as 2·07 per cent. of silicon. He had quite expected that the metal containing such a percentage would have gone to pieces in working, but instead of this it worked well. As to the separation of the interposed slag from the puddled bars he had, like Mr. Snelus, noticed the difficulty, but he had not been able to deal with it successfully. With regard to titanium, he thought ten years since that it had a very great effect, but the result of the experience he had since obtained was that he could not find that titanium has any effect on iron at all. As to the effect of silicon on steel, the case was different; he would like to see some experiments made. The workmen were apt to put in too much spiegeleisen, to lessen their work, and this had a bad effect on the quality of the iron; he would like to see silicon used, which he believed would also have the effect of making it more fluid, but whether it would be more brittle he could not say.

Mr. R. FOTHERGILL, M.P., would like to express the great thanks they owed to Mr. Snelus for his report. To him it conveyed information in a manner particularly clear and lucid. It appeared to him that the invention promised to do away with hand puddling, and not only so but to get the puddling done in a vastly better manner. It was customary among members of the trade to talk about the great economy, but he knew, and they all knew, that this pretended economy was never realised in practice, so that if a man told him that he produced a ton of puddled bar from ½ cwt. or 1 cwt. less than 1 ton of pig he simply did not believe it. They all knew that they lost one-fifth, one-sixth, or one-seventh of the material they put into the furnace, according to the skill of the workman. The mechanical plan did not appear liable to that waste, and if that were so it was very important. In effect this plan is to produce a certain proportion of malleable iron from the fettling, but we had not yet had an idea of the cost of the process. The success of the invention was established through the statements made by practical men who had carefully watched it, but at present he could not see the reason that it was a success. He would ask what was the patent which Mr. Danks claimed?

Mr. MENELAUS thought it better that that question should not be raised at present.——The CHAIRMAN said that if there were no other observations to make he would ask Mr. Snelus to reply.

Mr. SNELUS would ask Mr. Riley whether silicon steel had anything more than hardness? Would it bear the breaking weight of other steel?——Mr. EDW. WILLIAMS thought it would be better if the three papers on the puddling machinery were read before the meeting discussed either.

The general tenor of Mr. Jones's paper will be seen from the subjoined abstract.

Mr. JONES does not confine himself to what was done at Cincinnati, but shows what the machine will, probably, do in the future. Taking pig-iron at 50*s.* per ton, the rough cost of a works for turning out 600 tons of puddled bar per week is put down at 32,800*l.* The first cost of Mr. Danks's plant to give equal quantity of puddled bars is put down at 34,200*l.* Mr. Danks's furnace is not a good melter of iron, and it is suggested that the melting should be effected in a cupola furnace separately. The present cost of puddled bars in Cleveland (basis as before) is 4*l.* 11*s.* 2*d.*, and it is estimated that with with Danks's it would be 4*l.* 0*s.* 6*d.* The difference in favour of Danks's is, therefore, 10*s.* 8*d.* per ton. He (Mr. Jones) is of opinion that rails and other articles will be made direct from homogeneous bloom. After complimenting the excellent mechanical managements, he calls attention to the efforts made by Mr. Menelaus. Had Mr. Menelaus studied the chemistry of the process more thoroughly he would, he thinks, have been successful. Mr. Jones attributed the success of Danks's furnace to the utilisation of the fettling, which is entirely of oxide of iron. The commercial success of the machine would, he considered, depend upon the machine being kept continually puddling. He thought the question might also arise as to whether Danks's machine could not be utilised to purify metal for the Siemens-Martin process of steel manufacture.

Mr. LESTER'S report explained the practical details of the process. Instead of Iron Mountain ore he would use tap cinder, blue billy, &c., for the initial lining; and hammer slag, squeezer slag, or roller scale might be used for glazing. He expressed his opinion that the puddling was better done that it could be by any number by hand labour. A puddler, moreover, might easily work at the machine until he was 50 or 60 years old, and the manipulation was very easily learned.

The discussion was then adjourned until the following day.

The CHAIRMAN, in opening the third day's proceedings, expressed the hope that the interval which there had been since they separated would have given many of them time for reflection on the valuable papers which had been presented by the American Commissioners, and that many of them would, therefore, be well prepared to discuss the question. He would first call upon Mr. Siemens.

Mr. SIEMENS said it was not his intention to speak upon the subject. He congratulated the Institute upon the very valuable reports which had been read. They were aware that this was not the first attempt to provide a rotating puddling apparatus. Some years ago an apparatus was erected at the Dowlais Works by Mr. Menelaus, but there were practical difficulties which prevented it from being utilised. Those difficulties had apparently been overcome by Mr. Danks, by the introduction of suitable fettling material. In one of the reports surprise was expressed at the greater yields realised in puddling grey iron than in puddling white iron. The question was dealt with in his (Mr. Siemens's) paper, in which he endeavoured to prove that puddling was strictly a chemical operation—a chemical reaction between cinder and cast iron; and he showed, further, that for every pound of carbon in cast-iron 2 or 3 lbs. of metal must be reduced. If that view were correct, it followed that metal rich in carbon and silicon gave greater yields than others containing them in smaller proportions. Some years ago his attention was directed to a rotatory apparatus, not for puddling, but for accomplishing just the reverse operation—that of reducing oxides into a metallic condition. He had been carrying on experiments in the same direction since; and on some future occasion he might have the opportunity of bringing it before the Iron and Steel Institute. He could not fall in with the view that the furnace would be applicable to the Siemens-Martin process, because, in the first place, he believed that the necessary temperature could not be obtained; and another fatal circumstance was that the lining was composed of oxide of metal, so that the steel would part with all its carbon, and become wrought metal.

Mr. I. L. BELL was not a little surprised to hear Mr. Siemens state that the richer the iron was in silicon the better was the yield. He supposed that was due to the action of the silicon upon the oxide of iron; but there was a very general impression among puddlers that it could only be carried out to a moderate extent, because the silicon, by admixture with oxygen, was converted into silica. Highly silicised iron was, in point of fact, productive of very considerable waste, and when the quantity existing amounted to 2 or 3 per cent. it became unmanageable. In the North of England there was an ore known by the name of glazy-ore, which contained sometimes 6 or 7 per cent. of silicon; and it seems impossible to convert that into wrought-iron at all—or, indeed, to do anything with it either in the finery or puddling furnace. Mr. Siemens could not, he thought, mean to state as an abstract proposition that the richer the iron was in silicon and carbon the better was the yield.

Mr. SIEMENS replied that, as to carbon, the result had been proved by experiments he had made, in the most absolute manner. The richer the pig was in carbon the greater was the yield of wrought metal produced. The same chemical reason applied to silicon, though he quite admitted the arguments against the desirability of having much silicon in the pig metal which Mr. Bell alluded to. The silicon in the pig metal had to be converted into a basic slag, taking up a deal of oxide of iron, and the oxide of iron had to be supplied from the fettling. Therefore, if they puddled an iron containing much silicon a great amount of iron oxide was requisite to combine with the silicon; but by giving it an extra amount of fettling the chemical result still held good, and they could obtain from a pig metal rich in silicon a larger yield than from metal containing silicon; this was because of the atomic weight of silicon being less than the atomic weight of iron.

Mr. SNELUS suggested that the reason pig-iron containing silicon did not produce a better yield in the ordinary puddling furnace was that in that case there was only a limited supply of oxide of iron, and it was necessary to waste away a portion of the pig metal under treatment before the advantage became apparent. In Danks's furnace you have an abundance of oxide of iron, and he believed as long as oxide of iron was in excess the process would go on properly.

Mr. RILEY said that all could confirm Mr. Bell's remarks as to the effect of having silicon in iron. A white pig-iron, with 2 per cent. of silicon in it, practically speaking, they could not puddle at all. It worked dry, and if put into a refinery they might blow it for seven or eight hours, and it would not be workable then; but he agreed with Mr. Snelus that they were working under different conditions in Danks's furnace; in one case the silicon was oxidised at the expense of the iron and the other at the expense of the fettling. All practical men would be glad to hear this, and would only be too happy to find that it was so, as it was very easy to make a siliceous pig. There was a general opinion on the part of ironmakers that silicon, sulphur, and phosphorus were the great evils they had to contend with, and that the less they had of them the better. He was not disposed to agree in this view. He would put sulphur out of the question altogether; but with regard to silicon and phosphorus he thought they might be utilised. The only evil was that they had them sometimes in too great quantities, and hardly knew how to deal with them. A good white pig contained about 1 per cent. of silicon. A nasty iron, which they knew at once by its appearance, contained but one, two, or three-tenths of 1 per cent. of silicon. The top of it looked like so many peas; if they struck it with a hammer it sounded like a piece of lead; and in puddling the puddler could scrape it together in a very short time, and get out a heat of inferior quality puddled iron. If they added more silicon and delayed the time of the operation the iron would be more purified, and they would get a better result. When the Bessemer process was first tried at Dowlais, in 1856, ignorance prevailed on the subject. They started with ordinary white pig-iron, from which they blew nearly all the silicon and nearly all the carbon. The consequence was that they could do nothing with that iron; it all went to pieces under the squeezer, and they could not puddle it at all. With regard to phosphorus they knew that its existence in steel was, as a rule, very detrimental. If they took the very best Swedish pig-iron and puddled it what was the result? They got a red-short iron, and could not make anything else of it. Parry's metal also turned out red-short, but if a pig containing phosphorus were mixed with it they got a splendid iron. He thought that it was Brunel who said that phosphorus had a strengthening effect on iron. He agreed with Mr. Snelus that silicon does reduce to some extent the tensile strength of Bessemer iron, but Mr. Bessemer himself had always held that silicon made his castings sound, and he did not believe it would much reduce the strength of steel. He might mention that he had made iron with 3 or 4 per cent. of silicon which was perfectly malleable.

Mr. FORBES considered it a step in the wrong direction to attempt to reduce the fettling for the sake of getting additional iron. He would prefer the adoption of a fettling which would not melt at all, and, therefore, would not want renewal. He thought that if they took the reduction of the fettling as the basis they might as well go further and avoid making pig-iron at all.

Mr. SNELUS would prefer using a fettling that would give up its iron to the puddled bar, because that was cheaper than first making an extra quantity of pig, and then losing it in the puddling process. One hour suffices to fettle the furnace after eight heats, and the question was whether the cost of fettling outweighed the value of the extra weight of puddled bar produced; he believed the puddled bar was more valuable than the fettling.

Mr. FORBES thought the answer which Mr. Snelus had given led to the supposition that ultimately the principles of this rotatory furnace might be adapted to the production of iron direct without the intervention of the blast-furnace at all.

Mr. SNELUS explained that Mr. Forbes's views were impracticable. He mentioned that in the Danks furnace they had the carbon and silicon in a fluid condition, and he did not think they could get them in that condition except as an alloy with metallic iron. His own experience taught him that it was not possible to put more than 5 per cent. of carbon into pig-iron, but of silicon a larger percentage could no doubt be got in.

Mr. RILEY confirmed the latter remark; as much as 18 per cent. of silicon had been got into pig-iron at Tow Law works. At Dowlais they had made pig containing more than 7 per cent. of silicon. As to making wrought-iron direct from the ore, he thought there were no hopes; steel might, perhaps, be so made, but then it must be with very pure ore and very pure fuel to make it profitable. He felt convinced that all the improvements in iron must commence with the pig. With regard to steel, there was great difficulty in getting first-class tool steel. He thought it would pay to make a very high-class steel for cutting tools and punches. It was not a question of price, but of making a tool that would stand. He heard from Mr. Ramsbottom, of Crewe, that they could not get first-class tool steel, and were actually using up the old slide bars of some of the first locomotives made for the London and North-Western Railway Company.

Mr. I. L. BELL thought there was a certain amount of disrespect in speaking of the blast-furnace as a roundabout way of making iron. They complained that they first combined the iron with carbon, which they had afterwards to get rid of; but he would remind them that 90 per cent. of the iron ores they had to deal with contained from 30 to 40 per cent. of impurities, in the shape of clays and so on, and that it was the blast-furnace that got rid of those impurities. He agreed with Mr. Riley that there was no means so simple. As to red-short and cold-short iron, they frequently found the same iron both red-short and cold-short, so that one could not be considered the opposite of the other.

Mr. COWPER remarked that the waste of oxide of iron had been spoken of, but it should be remembered that the puddling-furnace did not reduce the iron; it was a question of cast-iron and carbon, and wrought-iron and oxygen in the puddling-furnace, but this would not apply to the treatment of ore.

Mr. FORBES said his question was whether it would not be better to do away with the reducing action in Danks's furnace?

Mr. COWPER thought not. The alleged waste was not at the expense of the furnace, but of the fettling.

Mr. J. A. JONES considered Mr. Forbes was under a misapprehension altogether in supposing that the fettling of a furnace ought to be refractory. If the fettling were refractory, Cleveland pig would be commercially valueless; it is the fettling that takes up the phosphorus. As to the rotary machine, he thought there was nothing more admirable in it than the beautiful manner in which the fettling was utilised.——Mr. E. WILLIAMS thought that the whole proposition of Mr. Forbes had been lost. He quite agreed with Mr. Forbes that if they could find a fettling that would not wear out it would be an

advantage; the easily reduced oxides might then be charged in with the ore. He believed the titanic ore would furnish the refractory fettling sought. Some of the iron used at Middlesborough had been found to contain 1¼, or a little more, per cent. of phosphorus, and much attention and consideration had been devoted to the question, how it was possible to eliminate that phosphorus. Up to this time they had not succeeded, and if the statements made here were correct, they had been working in a wrong direction, and the things which in the past they had been calling imperfections were in future, it appeared, to be sources of very great profit to them. Indeed, it seemed to him that they were in a path which would lead to the abolition of the blast-furnace altogether. In the paper read by Mr. Snelus he pointed out that phosphorus possessed the power of reducing many of the metals, and that it had a great avidity for oxygen. But if this were true, how was it that there were no means of getting rid of it by the Bessemer process. At present they looked upon phosphorus as their mortal enemy. It was found that no appreciable quantity of it was got rid of during the blow, and that being so, he did not quite see how it was to be got rid of in the Danks process.

Mr. MENELAUS thought Mr. Williams had altogether misunderstood what Mr. Snelus had said.

Mr. SNELUS said—Certainly. He was quite satisfied of the injurious effect of phosphorus, and that it does not go out in the Bessemer process. He was equally sure that it did go out in the puddling process. He was now engaged upon experiments in connection with this matter, and hoped hereafter to be able to explain the reason why this was the case. They could no doubt put carbon into the furnace cheaper than in the form of pig-iron, but when they put in the carbon in the pig-iron they got it into the furnace in the fluid condition, which they could not do by any other means. If it were urged that solid fettling should be used, and the oxygen supplied from extraneous sources, he would remind them that in that case the oxide would stand on the surface of the metal, so that in Danks's process three times the surface would be exposed to the oxidising influences.

Mr. DANKS said the question of puddling had been treated in a very scientific manner no doubt, and he did not intend to refer to the chemical portion of the subject, but as to the practice of puddling by the rotary furnace, and what was expected to be done by it, had been brought before the meeting in a very straightforward and intelligent manner. They talked about phosphorus and silicon being advantageous in pig metal. He frankly confessed that if this had been told to him five years ago he should have said that he would not believe it, but his experience proved to him that it was so. He had dealt very largely with iron containing an average of 2 per cent. of phosphorus and a large amount of silicon, and in the puddling furnace he had found those ingredients to be really advantageous, although he was not able to explain why it was chemically. In Chattanoga, there was an iron that contained about 2 per cent. of phosphorus, and required a very large quantity of oxide of iron for the lining of the furnace. In Tennessee, they worked a much better ore, and had difficulty in working it by hand-puddling at all, and even then it produced such a cold-short iron that a bar 3 or 4 in. in thickness would break if dropped. But by puddling that iron in his furnace the phosphorus and silicon were removed, and it became the finest, toughest, and most fibrous iron that could be found in America. He made a gain, too, of from 6 to 10 per cent. instead of a loss of 15 to 20 per cent., and he found that the larger the percentage of phosphorus and silicon contained in the pig the larger was the amount of fettling used. He had never found anything equal to pure oxide of iron for the removal of phosphorus and silicon. More than 27 years ago he was engaged in puddling ore direct, and he succeeded in making as good iron as could be made. He had since tried the operation in the revolving puddling-furnace, with ore containing 3 to 5 per cent. of silicon. The difficulty of introducing carbon as a reducing agent in the puddling-furnace was because they could not bring particle in contact with particle, and if they could it would require so much time that it would always be unprofitable. The main difficulty of puddling from the ore direct was owing to the large amount of impurities that have to be removed, and the length of time required in consequence.

Mr. SPENCER did not agree with Mr. Williams and Mr. Forbes, that they put in the fettling simply for the purpose of wasting it away. They started with a lining at, they would suppose, 40s. per ton, and they burnt out a portion of it in the form of a metal, which was saleable at 80s. per ton. Of course, there could be no economy in using an excessive amount of fettling; but as long as they obtained 80s. for that which cost them 40s. they need not complain much.

Mr. JONES confirmed the views of Mr. Spencer—the fettling was not wasted, but was really utilised and converted into iron. He could tell them, too, that the fettling would only be used as long as carbon, silicon, and phosphorus remained to be oxidised out. The lining must only be refractory after the carbon, silicon, and phosphorus has been oxidised out.

Mr. DANKS would add that if they had pure oxide of iron it would be next to impossible to smelt it; but, in practice, there was no such thing as pure oxide of iron. The purest he knew of was the Iron Mountain ore, which contained 3 per cent. of silicon. If they placed this Iron Mountain ore in the puddling-furnace they might succeed in getting it into something like a pasty form, but if they introduced 20 per cent. of silicon it became limped at a much lower temperature. After a certain amount of this oxide of iron had been taken up in oxidising the silicon and the phosphorus or carbon in iron, there was nothing more that could be melted, except a temperature were attained beyond what was profitable, or good for the iron. In the Danks furnace they first refined the iron; and before the boil they drew the impurities off, so that they could not contaminate the iron by further contact. The iron left retained nearly all the carbon it had when it was put into the furnace, and it seemed to give up the phosphorus and silicon before it parted with carbon. By raising the temperature of the furnace every part of the carbon was brought into contact with the lining of the furnace, and a pure iron was obtained. As to the question of cost, he did not know what the cost of the plant was likely to be in England, but he knew what the cost was in America. He sold the furnaces at the $1500 currency, but in working order the cost was from $1800 to $1900, according to locality. He complained that Mr. Jones had credited him only with pig metal saved, instead of with extra puddled bar produced, and claimed a saving of 1*l.* per ton.

Mr. JONES said Mr. Danks must have misunderstood his statement. He had given Mr. Danks the fullest credit, for he had taken the best actual results obtained at Cincinnati, and had assumed similar results to be obtained continuously night and day, the rotary furnace being thus kept continually smelting, whilst the metal was melted in a separate vessel. This was really assuming that Danks's furnace would do what it never yet had done. As to the application of Danks's furnace in connection with the Siemens-Martin process was that, if by Danks's furnace you could take out the phosphorus and other impurities, the refined metal might be used in the manufacture of Siemens-Martin steel.

Mr. SIEMENS would admit that if it were reduced to a question of refining the iron it was not impossible, but that would depend upon how pure it was made. If Mr. Samuelson had told him that he intended to make the steel in the Siemens-Martin furnace from Cleveland pigs, he would at once have said that he did not believe it. He agreed with Mr. Danks that the increase is only at the expense of the fettling, and that part of the silicon is burnt off by the flame. The difference between economical and wasteful fettling was, in his opinion, whether you utilise or waste the fettling.

Mr. SNELUS took samples of Cleveland metal, and found that it contained ·424 per cent. of phosphorus, which was enough to be quite fatal to good steel, and the question is whether by the new process they got the produce sufficiently free from phosphorus to make good steel. If they had a highly silicious pig-iron they would find that as silica cannot exist as such in the furnace it will take up more oxide, until the iron is purified.

Mr. HOPKINS invited the members of the Institute to visit the works of his firm to see Danks's furnace in operation.

END-THROW ROTARY PUDDLING-FURNACE.

Mr. SPENCER read a paper on his new puddling-furnace, which may be described as a modification of Warren and Walkers, the modification consisting in forming the puddling chamber of four tray-like segments instead of a cylinder. He stated that the charge in the present machine was about 10 cwts. of molten iron, and was poured in at the flue, into or through a small hole at one of the sides. The machine was then made to revolve slowly for about five minutes, when the boil commenced. The boil lasted about ten minutes, and the door was then opened, and the balls withdrawn by means of a long tongs, and placed on a bogie, taken to the hammer, and immediately rolled off into bars of the required sizes. With the first machine only about 5 cwts. could be puddled, and the process occupied about 50 minutes. The present machine saved half the time, and more than doubled the production. The largest production from one heat had been 1430 lbs., and the shortest time for a single heat had been 13 minutes. The quality was beyond all question, as it had been proved by working, by fracture, and by analysis. The metal used had been Cleveland, of various mixtures, down to the Cleveland cinder. A machine was now being constructed to convert 1 ton per heat, and he had no doubt that ultimately 5 tons would easily be converted: if the division of the mass could be maintained the process would be very simple. As to balling up, he considered his plan was advantageous; he saw no advantage in having his balls too large, and if he could get them weighing only 1 cwt. each it was all the easier to work the heat. The division into balls, however, depended entirely upon the heat and speed of the machine, for he found that if you lowered the speed and increased the temperature you got a single ball at once.

Mr. MENELAUS had no hesitation in saying that Mr. Spencer has produced a perfectly practicable machine; it would puddle, and puddle well. Beyond all question it is convenient to divide the heat into balls, because you could thus use the present squeezers, &c., erected on the works. But he felt that he was trying to get over a greater difficulty than would be met with in dealing with the larger mass of iron. He feared he, to some extent, sacrificed economy, and would rather rely upon cutting up the mass afterwards.

Mr. SNELUS had compared the analyses of Danks's and Spencer's puddled iron. At Cincinnati the iron was put in cold, and in Mr. Spencer's case the iron was run in melted, and there was a better result. There was 2 per cent. of phosphorus in the Middlesborough pig, and the reduction of phosphorus was certainly greater in Mr. Speneer's furnace.

Mr. WHITWELL was of opinion that putting in the pig cold assisted the purification of the iron.

Mr. SPENCER said that he had operated on the worst class of Cleveland pig; the iron was next to worthless. They gave the diagonal throw to the furnace, in order to obtain a better result, and did not anticipate that the heat would be by that means divided, as they subsequently found it to be.

Mr. HOWSON next read a paper by himself and Mr. Thomas describing their invention. It consists of a rotating chamber, occupying the position of the present puddling-hearth. It was claimed that it could be applied to the present puddling-furnace at small expense.

Mr. JONES suggested that the withdrawal of the chamber to take out each heat would lead to great loss of heat.

Mr. COWPER could not understand how the joints were to be kept tight.——Mr. HOWSON replied that practically the joints might be half-an-inch open without inconvenience.——The CHAIRMAN then called upon Mr. FRED. A. PAGET, C.E., for his paper—

"ON DORMOY'S PROCESS OF MECHANICAL PUDDLING."

The plan about to be described has been applied to forty puddling-furnaces in different parts of Austria and France. The nearest of these works are at Rimancourt, near Saint-Dizier, in the department of the Haute-Marne, France. Three of M. Dormoy's apparatuses are now there at work, and the plan is being adapted to all the remaining pudding-furnaces.

Its leading feature consists in placing a rabble, rapidly rotated by steam-power, in the hands of the puddler. The ordinary furnace itself is left unchanged, except that the sides of the bed are set at an angle instead of being vertical.

To adapt the plan to any common existing puddling-furnace a shaft conveying power from any prime mover is carried about 6 feet above the furnace. A belt from a pulley transmits the rotation of the shaft to another pulley or sheave below, which rests on the belt a little in front of the furnace-door. One end of the top of the pulley is so jointed to a handle held by the puddler that the pulley can rotate without carrying round the handle. The other end embraces the outer end of the rabble, to which it is held by a cross-pin. The belt is thus made to rotate the rabble in any required position, in a somewhat similar way to the well-known rotating hairbrush. The number of revolutions employed is from 300 to 500 per minute for white pig-iron, and from 800 to 1000 for grey pig. The hanging belt, while carrying and rotating the rabble, endows it with mechanical energy, and allows the stirring and puddling action to be directed to any portion of the molten metal. The rapidity with which the tool can be worked round gives the metal such an impulse that it turns horizontally on the bed, continually renewing the surfaces in contact with the atmosphere. The point of the rotating rabble, instead of being hooked, carries a disc. When the iron has "come to nature," this is replaced by a rabble having a short twisted point.

The following are figures giving the work done at Rimancourt by one of these furnaces during the first two weeks of last December:—

Working days of 24 hours..	1	2	3	4	5	6	7	8
Number of charges.....	23 ..	23 ..	23 ..	24 ..	24 ..	24 ..	25 ..	28
Working days of 24 hours..	9	10	11	12	13	14	15	
Number of charges.....	26 ..	25 ..	26 ..	26 ..	25 ..	24 ..	23	

Total, 369 charges; during which the furnace was fettled only nine times, or one fettling on an average per 40 charges.

The charge of pig-iron and of hammer-slag for the bed amounted to 97,060 kilos. This amount produced 81,921 kilos. of iron, with a consumption of coal of 45,240 kilos., which gives 1181 kilos. of pig per 1000 kilos. of wrought-iron produced, and with a consumption of only 552 kilos. of coal per metric ton.

Briefly, the result of different trials shows an increase of at least 30 per cent. in the yield, with a proportionate diminution in the consumption of fuel. In spite of the greater number of charges, the puddler is very little fatigued.

This process, both in Austria—where it has been three years at work—and in France, has been found to eliminate phosphorus and sulphur to such an extent that inferior kinds of pig produce iron equal to good charcoal brands.

The proceedings terminated with the usual complimentary votes of thanks.

RAPID WAGES CALCULATOR.—Amongst the articles exhibited at the meeting of the Iron and Steel Institute the "Rapid Wages Cylinder," of Mr. John Bellows, of Gloucester, attracted much attention. It is a ready-reckoning table so mounted on a cylinder that the exact amount of wages to be paid to a workman (calculating to the quarter hour) is brought under a straight edge, so that it can be seen at a glance no matter whether the rate of wages be 2s. 6d. per week, 40s. per week, or anything between. Odd halfpence being seldom paid in practice, the fractions of a penny are wisely omitted, but to indicate whether the neglected fraction is more or less than one halfpenny a prominent dot is used in one of two positions. If the true amount be less than the halfpenny, the penny below is written with the dot turned up, thus 9·d. for any fraction under 9½d., and 10.d. for any amount between 9½d. and 10d. As the rate of wages per week is printed on the fixed straight-edge, and the amount payable for any number of hours and quarters from 1 to 80 can be instantly brought under it, the rapidity with which the references can be made is astonishing. Wherever 50 men are employed the machine would repay itself in a twelvemonth; it has already been extensively adopted, and deserves to be much more so.

THE MANUFACTURE OF CHLORATES.—The invention of Mr. W. WELDON, of the Cedars, Putney, consists in substituting either magnesia or alumina for the lime which is at present employed in the manufacture of chlorates, so as to obtain a residual product consisting of either chloride of magnesium or chloride of aluminium, or a mixture of both those chlorides; in then decomposing by heat this residual product, so as to obtain its chlorine in a useful form, and at the same time to obtain magnesia or alumina for use again; and in combining the above described method of manufacturing chlorates with the production of the chlorine employed therein, by means of oxides of manganese regenerated by means of magnesia. This invention thus enables all the reagents employed in manufacturing chlorates to be used over and over again perpetually.

PULVERISING MINERALS.—The invention of Mr. WILLIAM PROSSER, of Corporation-street, Manchester, consists—first, in impinging the substance or substances to be pulverised with a greater or less degree of force, according to the nature of the substance, and also according to the degree of fineness to which they are to be reduced, against a revolving cage, or a succession of cages, the periphery of which is formed of bars of iron or other material. The force is generated outside and independently of the cage or cages, and may be obtained either by compressed air or steam, according to the nature of the substance to be pulverised. Second, in causing a cage formed as above to revolve in a trough containing mercury, water, and reduced auriferous substance. The revolving cage breaks the mercury into such small globules that so large a surface is presented to the particles of gold that they are readily amalgamated. Tailings may thus be economised.

Royal School of Mines, Jermyn Street.

[FROM NOTES BY OUR OWN REPORTER.]

LECTURE XXIX.—The question of arching levels is one on which there is great difference of opinion; but when a mine is to be worked under a long lease, and the area is considerable, there will always be portions at least of the levels which it will be cheaper in the long run to arch with stone or brick. Of course, when the success of a mine is a matter of ephemeral interest to those who hold it, cheaper plans will be devised. I have already spoken of timbering of a merely temporary character put in to secure the ground for a time, the timber afterwards to be removed and replaced, or to be lined internally with masonry. Even the spilling I described in the last lecture, where sets or frames of cast-iron and laths of wrought-iron are employed, their object is merely to advance in the ground to a certain distance, after which masonry should follow. So in driving the Thames Tunnel, where a strong frame, called a shield, was used, and which in mining levels is represented by three or four frames of iron, arching at the back, whether of shield or frames, is necessary. I should mention, *en passant*, that iron frames are not common, but where used are said to answer very well. When, however, the object is to get through the ground rapidly, some modification of this system is necessary. In these cases the nature of the ground overhead and at the sides must be carefully looked to. Those portions of a mine which are generally thought desirable to have secured permanently are the entrances to a deep set of workings, or a deep adit level, especially when the latter has to be employed afterwards in removing the mineral by conveyances of any kind, and where it would be prejudicial and expensive to have to replace timbering very frequently.

Again, in coal or other mines on stratified deposits there are certain places in the levels necessary to be opened out at a greater width than usual, as, for instance, "pass-bys;" and, again, where there are inclined planes, for one service of wagons to go up one, and another to come down the parallel road. Then the ventilating furnaces and the furnace drifts into the shaft should be lined with brick or stone, principally because flames and smoke fly along for a considerable distance, and it is important to keep them from material so inflammable as coal, which might by being set on fire do irreparable damage. In the case of mines being worked out very rapidly it is another matter, and there are other reasons why they are not able to put in anything but timber. Take, for example, some of the larger lodes in Hungary or Mexico, where there is great breadth between the walls, and were the lode is (say) 60 feet wide. True, there may be a road formed by a cross-cut from a shaft, in which it may be desirable to put in permanent masonry, and if there are sets of masonry only put in here and there the expenditure will, perhaps, be extravagant; but if you drive into the mass of the lode itself, then it is a question as to what method can be adopted by which the levels can be secured after the working has gone on for some length of time, as masonry cannot stand without a firm foundation, and a movement of the ground would be fatal to it. If, however, the introduction of masonry be suitable and advisable, another point is what material can be introduced for the purpose. There are few of the metallic mines in which the system of "stilling," or "steining," is not employed; and in collieries there is a quantity of strong stone walling put in, called "pack walls." Few metalliferous mines fail to yield materials suitable for this sort of operation; but where they have a slabby stone in the mine it is the best of all materials for securing the levels.

There are some sorts of rocks met with in mines more favourable than in others. All such material as breaks irregularly into polygonal fragments, or which is liable to decomposition, as iron pyrites for instance, are obviously improper for use. But those usually found in coal and iron mining districts—the sandstones and grits obtained in the lower parts of the coal measures—form very useful material, and being frequently of a thickness suitable for slabs, that allows of their being quarried at a cheap rate, and thus easily brought into the workings. Where the roof is allowed to fall after the coal is obtained the debris often yields slabs suitable for pack walls, but the sandstones are useful for the more accurate sorts of masonry. At this time admirable work may be seen in the North of England, where not only the levels but the shafts are lined with stone.

In some North of England mines a flaggy gritstone, which also extends into the millstone grit, is so placed that the miners can get the stone themselves, and execute the work. Indeed, in the Aldstonmoor district, and in some of the Yorkshire dales, it is not only usual to bargain with the men to drive the levels, but to line them with roughly squared stone or dry masonry, as it is called. Limestone, when it will break into convenient thicknesses, is a very strong material, but if it has to be tool-dressed it is too expensive. In Derbyshire and Flintshire, however, it breaks into thin slabs, and is much used. The limestone lias, found in Devon, is often used, and its expense is not serious. Gneiss, mica-slate, hornblendic schists, and clay-slates come into play very frequently. In Saxony, for instance, the former is much approved. Clay slate, in North Wales, comes into extensive use. Granite is employed more rarely, in consequence of its tendency to break into irregular blocks; but when obtained in slabs of proper thickness comes into play with good effect. I may mention, as an example, the copper mine of Tresavean (which has long been standing full of water, to be worked again, no doubt, at a future day), as noted for the excellent character of its arched levels, carried out with granite slabs. And in Spain, in the more ancient mines—whether constructed by Romans, Carthaginians, Moors, or Spaniards, is extremely uncertain—the workmen used slabs of granite in this way. The other classes of rocks in which metallic veins occur are not so useful. Greenstone and porphyry may occasionally be tried, but they are apt to be irregular in their joints, and subject to a great amount of decomposition. In some coal districts, where these materials are entirely wanting, nature has provided a remedy in the shape of clays and clayey shales, which when ground up may be made into bricks, which forms a cheap substitute for stone, and, in fact, when these clays can be had stone is rarely used in preference. In Staffordshire and Derbyshire the walling of shafts is of brick, and brick arching in the levels is largely employed. Then comes the question of lime. In most cases such work as I have mentioned is dry, and in many places stone or brick is placed together loosely on purpose, so as to allow water to pass through, but now and then it is necessary to obtain mortar, which should be of that kind called hydraulic, which will set hard in a damp atmosphere. Formerly lime which had this quality was brought from great distances, at a serious expense, and yet all the while an equally suitable material was lying unused close by in the shape of certain limestones of the lias formation, and also of some of the dark impure limestones of the upper part of the carboniferous limestone, which in Flintshire is now largely worked. In many levels it is a matter of great importance to get materials of this kind.

Some consideration is due to the modes of putting in arches in the best way. The simplest practice of all is that to be seen in some of the older mines of Derbyshire, something analogous to which may be seen in the South of Spain. In Derbyshire, the walls being tolerably strong, a hitch is cut in one side, and a slab of limestone of suitable thickness—say, 3 inches or 4 inches—is put across, and occupies the place of a stull-piece of timber, amply sufficient to support the attle, or unworked ground, above. In Spain, a hitch having been cut on both sides, a couple of slabs of rock, sometimes of granite and sometimes of the sandstone overlying the granite, are placed so as to form a pointed figure, like the letter A, the space on the sides of the apex being filled with attle, firmly compacted together, so as to keep the arch stones in their places (see Figure 1). Very ancient instances of these rude archings are to be found apparently sounder, as when they were first put in. A modification of this plan is also found in which the sides are of dry stone walling, and the arch is started from that. This kind of work may be seen not only in the passages of the Great Pyramid of Egypt, but in our own slate quarries in Wales, and occasionally in some collieries where they have present the material called "stonebine," which breaks readily into slabs. These, however, are not placed on end, but laid one upon another, the second projecting over the first, the third still further over the second, and so on from each side until they meet in the centre of the level, the outer extremities being well weighted to give stability to the structure. (See Fig. 2.) Where they have large slabs, as in the North Wales slate quarries, there are very curious erections of this kind, under which the men are sheltered while dressing the slates.

Fig. 1.

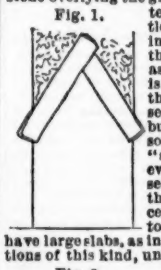
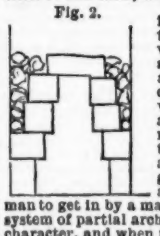


Fig. 2.



In German mines there is a great deal of floor arching—that is to say, instead of letting water run along the level, so that the men have to walk through it, they have arched ways, so that the men walk dryshod, and the water runs away beneath their feet. I am sorry to say the Germans are far ahead of us in many things which relate to the facility and comfort with which the men pass to and from their work. It is true our men think little about it themselves, and the masters still less, but in Germany such a thing would not be permitted for a moment. They do not like to wet their feet at all, and thus a great deal of water is conveyed along the levels in arched ways under the floor, resting on good foundations, large enough to carry off the water and also to admit a good current of air, and with room for a man to get in by a man-hole left for the purpose to clear it of sediment. Another system of partial arching is common where the ground is not of a troublesome character, and when the pressure is not very considerable. In such cases, girdles, as they are called, or arches, are put in at 2 ft. or 3 ft. distance from each other. At Almaden, in Spain, a good deal of this sort of stonework is put in.

In many mines it is necessary to construct walls to keep back refuse. In slate quarries, where the refuse must be estimated by hundreds and thousands of tons —whole mountains, in fact—the difficulty of dealing with it, for want of area, is very great. In ordinary metallic mines and collieries there are few in which we do not see something of this kind, but in slate quarries the refuse has to be dealt with on a large scale, where it is not only to build maintaining walls of great strength, but to support them with buttresses and slopes to enable them to resist the lateral pressure brought against them. In these cases the base is often as thick as half the height. At the lobby or outlet of an adit level it is necessary to put in walling. In the levels themselves frames of partial masonry are often put in to check at the most opportune point signs of failure. In the stratified rocks a great variety of circumstances require special treatment. One side, for instance, may be pretty strong, while on the other pressure may be apprehended from the roof. A pack-wall is then put in at the side, and a semi-circular arch of brick. In metalliferous mines the pressure comes in another way. If they have to deal with a lode of moderate breadth having walls of moderate strength, a flattish arch is put in from niches made in the walls of the lode, in which case the intervals must be closely packed to meet pressure from above. In the long levels of the North of England the barrel arch is most frequently seen. The miners themselves are generally masons sufficiently to

put up an arch, and bargains are often made to drive at so much per fathom, including the putting in arches of certain dimensions. In the case of metalliferous mines, arches are frequently thrown across a lode, when one wall is not considered safe, to support it. In mining arches of all shapes are used, and it requires no little judgment to decide which sort is best calculated to meet the pressure. When the pressure comes from all sides it is necessary to put in complete circles. An illustration of this kind of arch may be seen in the sewers of London. Elliptical and egg-shaped are common in mines, the latter being used when it is necessary to carry off any quantity of water. The purposes intended to be carried out by arching, and the dangers it is intended to meet, are so various that a large field is opened for the skill and judgment of the mining engineer. [The lecture was illustrated by a large number of drawings and diagrams.]

THE DIAMOND TRADE.

ROUGH DIAMOND SUMMARY FOR CAPE MAIL STEAMER, MARCH 25.

Since the date of our last report (Feb. 24) a very large trade has been done in Cape Diamonds, and up to the 7th inst. prices had somewhat given way under the pressure of sales to be advised by the outgoing mail of the 8th; but on the 8th a reaction suddenly set in, the market became considerably firmer in tone, and from the 8th to the 15th inst. considerable sales were effected at improved prices. We attribute this to the combined influence of the following causes:—

1.—The market prior to the 8th inst. had been cleared of a large quantity of outstanding importations.

2.—The small quantity brought forward by the steamer Celt arrived on the 8th inst.; the indications of a prospectively diminishing supply, and the expectation that within a period more or less remote, variously estimated at from three to twelve months, the deposits of "New Rush" would be exhausted.

3.—The presence in London of a few continental buyers, who imparted to the London dealers a spirit of healthy competition.

Within the last eight days (that is, from the 15th) a very limited business has been done, but few large parcels have been offered, and sellers and buyers have rather held back, awaiting the intelligence expected by the Syria. So far as we have yet been able to ascertain the importations by this steamer are of moderate amount, and the intelligence she brings is confirmatory of the news received by the Celt of diminished "finds," and a prospective further decline in supplies. At the same time, it is a great pity that the majority of the newspaper press do not emulate the cautious reticence of the *Times*, but gratuitously assume the value of the diamonds imported by the Syria not manifested to be 150,000*l*.—a perfectly wild conjecture, the accuracy or probability of which they have no means of testing. Although the market is decidedly firmer in tone, we must guard our friends against forming too sanguine expectations. We believe the high prices obtained six months since are gone beyond recal, and that, at any rate, some years must elapse before prices then ruling for large stones will be again obtainable. We subjoin quotations of the present current values:—

Bort, 15s. to 17s. per carat; common cleavage, 22s. to 24s.; moderately good cleavage, 27s. to 30s.; good cleavage, about 32s.; good and large cleavage, about 35s. to 40s. per carat.

The values of diamonds, well formed and free from flaws, may be taken as follows:—

Yellow description—2 carats and under, about 30s. to 35s. per carat; 3 to 5 carats, about 45s. to 50s.; larger sizes, 3*l*. per carat and upwards, with values increasing very slowly and gradually with size.

Light yellow descripton—2 carats and under, about 50s. per carat; 3 to 5 carats, 60s. to 70s.; 6 to 10 carats, about 80s.; larger sizes, 90s. per carat and upwards, increasing in value slowly in proportion to size.

Slightly off-colour description,* somewhat offensively termed "Cape White"—1 carat and under, 2*l*. 10s. to 2*l*. 15s. per carat; 2 carats and under, 3*l*. 5s. to 3*l*. 15s.; 3 carats and under, 3*l* 15s. to 4*l*.; 4 carats and under, 4*l*. 10s. to 5*l*.; the values of larger sizes increase slowly in proportion to size.

Diamonds of the first water, such being very rare, and not forming 3 per cent. of the importations from the Cape—¼ carat each and under, about 3*l*. 15s. per carat; 1 and under, 4*l*. 4s.; 1¼ and under, 5*l*. 10s.; 1½ and under, 5*l*. 10s.; 2 and under, about 7*l*.; 3 and under, 8*l*.; 4 and under, 9*l*.; 5 and under, 10*l*. to 11s.; 6 and under, 13*l*. to 14*l*.; 8 and under, 15*l*. to 16*l*.; 10 and under, 17*l*. to 19*l*.; 12 and under, 20*l*. to 22*l*.; larger sizes nominal.

Gresham-street, London, March 23. PITTAR, LEVERSON, AND CO.

* Diamonds of this description are generally invoiced from the Cape as "of the first water."

CLEVELAND PIG-IRON TRADE.—Since my last report, at the beginning of the year, prices of Pig-Iron have steadily advanced, and have reached figures which not long since were considered impossible by the most sanguine. The advance during the last two months amounts to about 15s. per ton; and facts having so completely outrun expectation, people are now beginning to make up their minds to see most extreme prices: 90s. and 100s. for No. 3 pig-iron are spoken of as not improbable. The fact is, that it interests very few people in our district to what extent this rise may continue. Both makers and merchants are so well sold, and have such great difficulty in fulfilling their engagements, that they cannot avail themselves of present prices to make further sales, and consequently but little business has been done of late. It is not easy, under existing circumstances, to ascertain what is doing; but the following figures, which have come to my knowledge, may serve as a guide.

Recent sales have been effected for delivery during the first six months of this year, at 80s. to 85s. for No. 3. For delivery during last half of the year, 78s., 80s., and even 90s. has been paid. For delivery over 1873, contracts for large quantities of forge iron have been closed at 70s., 73s., and 75s.; and for delivery over 1873 and 1874 inclusive, 60s. to 65s. per ton. These figures, I think, will tolerably well reflect the anomalous state of things in our market. The great trouble, as I have stated, is to fulfil engagements already entered into. Both consumers and exporters have a very hard time. There is no stock in any of our foundries or mills, and it is not an unusual occurrence for works to stand for want of iron. The losses to exporters are, on one hand, demurrage on steamers waiting for their cargoes, and on the other, lawsuits by their clients abroad for irregular delivery.

I believe that none of our makers have sold more iron than they could, under ordinary circumstances, fairly produce. Many of them have ever a balance unsold, in order to meet unforseen circumstances; but the supplies of ironstone, and especially of coke, have all along been so very bad, that many of our makers not only could not turn out the full quantity of iron they usually made, but owing to inferior coke being thrust upon them, coupled with irregular working of the furnaces, they have not been able to get beyond the lower numbers of forge iron. The coalmasters, with whom our makers have their coke contracts, take for excuse the combination of the pitmen to restrict the output of coal, in order to coerce the trade to pay higher wages. It is to be hoped that this state of matters will now cease, as the Durham coalmasters have lately acceded to the demand for 20 per cent. increase in wages, and made other concessions in favour of the men, so that the latter may now settle down to regular work again. There are at present a number of lawsuits pending or threatened, in consequence of irregular and short deliveries of iron, but as makers are covered by the strike clause, the result is doubtful. Most of the high prices paid here have been for the English market. The Continent has been buying but little at these figures, the large contracts for this year's shipment having been made last autumn at low prices. In fact, a good deal of this iron has latterly been re-sold in the English market.

Of course it is difficult to say how long the high prices may continue. Iron is scarce, and as the demand seems to exceed the means of supply for the present, we should think that nothing but prohibitory prices restricting the use of iron will stop the rise. Some people fall back on the experience of the past for their prediction of what we may expect. There exists a feeling that we have been going too fast, and that a corresponding reaction must prove disastrous to the trade. It must be borne in mind, however, that as long as the high prices for coal and wages continue (and nothing but a general prostration of trade can check these) we shall not again see such low prices as we have had in this district. We shall have to accustom ourselves to consider 50s. to 52s. the lowest prices of iron here, against 42s. and 44s. in former times. Of course the laws of supply and demand will rule here as elsewhere, and I do not mean that the price must not be less than 50s. or 52s., but if our full make of iron cannot be sold at or above these prices, the make will have to be reduced,

I have to record that the present high price of manufactured iron is again bringing a good deal of foreign iron into our market, especially Belgian bar-iron and puddled bars. Of the latter some large quantities have been bought for this district. Altogether we cannot say that the pig-iron trade is in a satisfactory state. Abroad, the prices will, by degrees, shut us out from some markets, whilst at home they are ruinous, especially to the small consumers who have work on hand, and who are in the habit of buying from hand to mouth. The daily reports of the Scotch Warrant Market also reflect a feeling of nervous uneasiness. It seems as if operators were constantly on the *qui vive* to realise profits, watchful not to be holders of iron should anything suddenly arrest the upward movement.

Rails are quoted at 9*l*. 15s. and 10*l*. per ton. Ship-plates 12*l*. per ton, at which prices business has been done. There is, however, not much demand for plates at this figure. There is a falling-off in the orders for new ships, the rise in ironwork, engines, and wages having raised the cost of steamers considerably. Coke is so scarce here that 25s. per ton has been paid for small lots. Some people ask as much as 30s., and even at these prices a regular supply cannot be depended upon. In the principal coal districts on the Continent a strong reaction has set in. The high price of coals hitherto, in Silesia and Westphalia, has been occasioned by workmen who had been drafted into the army, and the scarcity of means of transport. These inconveniences having ceased now, the supply of coals in Silesia is so great that large dealers have sacrificed heavy amounts in penalties by throwing up contracts at high prices, and consumers are refusing to receive coals which are thrust on them in larger quantities than they require, and they also refuse to receive arrears. In consequence of this, coal and coke are offered in large quantities at steadily falling prices. Both Silesia and Westphalia contain large coal fields which have not yet been fully opened out. However, owing to the abundance of capital in Germany at present, this field of operations is being opened up, and the German railway companies are already preparing for a large increase in mineral traffic by constructing branch lines.

The steam-ship owning business is having a bad time of it, at least on this coast. The gloomy predictions about this trade being overdone seem about to be realised sooner than expected. The high price of English coals, and the falling prices of Silesian and Westphalian, leave many steam-colliers trading last year to German ports without employment. This, with the scarcity of iron, and the late large additions to our steam tonnage, have raised an eager competition for freights. Steamers are now freely offered at 7s. 6d. for pig-iron to Rotterdam, Antwerp, and the north of France; 8s. Hamburg, and 10s. Stettin. If this lasts, we shall see a collapse in more quarters than one.—C. E. Muller, Middlesborough.

IRON—PROPHECY FULFILLED.—"There is no question that given the normal condition of things throughout the Western and Eastern world, there would be no cessation in the construction of new railways—pioneers of progress—necessities of the second half of this most wonderful of centuries, heralds and advocates of the peaceful interchange of the products of the earth, as well as of international sympathy and good-will. Enormous, therefore, as are the existing sources of iron supply, they might soon be taxed to the utmost were rational counsels again to prevail among the powers that be; and looking to the gap created in the available manual and skilled labour fund of Europe by the events of the past six months, it is difficult to maintain any rational belief whatever in a prolonged low range of prices for rolled iron, in case of the early capitulation of Paris, particularly if followed by the final termination of the war."—From a circular issued early in 1871, by G. B. Toms and Co. [Railway Iron was then 6*l*. 10s. per ton; it is now 9*l*. 10s.; Scotch pig-iron then about 60s., and is now worth 87s. 6d. per ton.]

TINCROFT AND CARN BREA MINES.

The tri-monthly meetings of Tincroft and Carn Brea, of both of which Capt. Teague is the manager and the largest shareholder, and which to a large extent are in the hands of the same proprietors, were held, on Tuesday, in the account-houses of the respective mines, that of Tincroft taking precedence. The meetings had been delayed by Capt. Teague, in order that advantage might be taken of the increased prices of tin which he believed to be in store, and the result justified his foresight in holding back by giving considerably increased dividends. There was a large attendance on both occasions.

Capt. TEAGUE, in opening the business at Tincroft, after a jocose reference to some censures which had been cast upon him in connection with his postponement of the meetings, read the accounts for October, November, and December, which showed—Labour cost, 4009*l*. 13s. 3d.; merchants' bills, 1539*l*. 10s. 7d.; carriage, 111*l*. 12s. 9d.; dues, 734*l*. 1s. 6d.; Vice-Warden's assessment, 75*l*. 5s. 6d.; income tax for 1872, 414*l*. 4s. 4d.; Bolitho and Co. banking charges, 44*l*. 0s. 9d.; total disbursements, 6886*l*. 8s. 8d. The receipts were—Black tin sold, 219 tons 6 cwts. 3 qrs. 8 lbs., 19,416*l*. 5s.; copper ore, 268*l*. 18s.; tin carriage, 47*l*. 18s.; total, 19,733*l*. Deducting cost, this left a balance of 12,846*l*. 12s. 4d., which, with the balance from last account, made an available amount for dividend of 13,837*l*. 15s. 3d. The receipts, Capt. Teague explained, would not have been so large if he had not kept back the tin, which had enabled him to get a better price for it by 9*l*., and made a difference, on the whole, of 1300*l*. If it had not been for that they would hardly have been able to give the 2*l*. dividend. What was now proposed to be done, instead of giving a dividend of 3*l*. and a bonus of 10s., was to give a dividend of 2*l*. and a bonus of 2s. 6d. (Applause.) He thought, therefore, that the shareholders would be satisfied with the results that had been accomplished, and that he should not get very seriously blamed for the delay. (Applause.) Capt. Teague also read his report on the mine, which concluded with the words, "At no period whatever did the mine look better than at present. Our tin ground is greatly lengthened in the western part, and shows great permanency." (Applause.)

On the motion of Messrs. HINGSTON and SHILSON, the report and accounts were adopted, and the dividend declared as recommended.

CAPT. TEAGUE asked for an expression of opinion on the part of the shareholders with regard to the abolition of the five-weeks month.

Mr. HINGSTON was heartily glad it was gone, and moved a resolution approving of the conduct of Capt. Teague in abolishing it, which was unanimously carried. Mr. Hingston remarked that he believed the change was inevitable, and thought it much better for Capt. Teague to have anticipated it than to have had it forced upon him. (Applause).

Capt. TEAGUE observed that there had been some controversy with regard to the five-weeks month. He had seen that the time was come when something should be done, and without consulting a single soul, or having heard anything from anyone, he took the step of calling the men together and doing what he thought would satisfy them. He believed that the time had come when the services of the men should be recognised. Many people had said that the men were not benefited by it. But that he could not understand; for the monthly men now got 13 times a-year the amount they used to get 12 times, which would be equivalent to their having their rent additional. Others had said they could not see how the working miners would benefit. But that must follow, and it would be done in this way. Where they had been paying men 8*l*. a fathom they would pay them 8*l*. 10s. The working miners would participate in the advantage equally with the monthly men, and indeed he thought to a greater extent. Most of those who were conversant with mining would see how these benefits would accrue. He also believed that the men were doing more work since the alteration had been made, and that instead of having 12 samplings in the year they would have 13, and these in the same proportion as the 12. Therefore the change benefited the adventurers as well as the miners, and even to a greater extent. What he looked upon as a very great advantage was the abolition of the Maze Monday, which generally ended in drinking and disturbance. The men had given it up very readily at his request, and he believed they were beginning to see their gain. Some people said that the miners ought to have a day or two now and then to themselves, but he did not suppose that the miners worked on the average more than 36 hours a week, and that gave them plenty of time for tilling their gardens, recreation, or improvement. He hoped the shadow of the dividend they had had that day would never grow less. They would bear him witness that he had never promised very much, but he trusted that everything he had promised he had fulfilled. (Applause.) However, this time he had appended a few words to the report. (Hear, hear.) Up to a very recent period their tin ground in the western part of the mine was only about 45 fms. long. They had valued that day the 220, over 80 fms. to the east of the boundary, and worth fully 45*l*. per fathom. They had tin nearly 100 fms. in length, and that certainly must be an improvement. They had been doing all they could do fairly, and he believed they had not only a good but a lasting mine. The 234 was not only the bottom end in the mine, but it was also the richest, and that was a most significant and encouraging fact. There was one thing that he wanted to mention, the necessity of procuring additional stamp power. It was not reasonable that they could always expect to have stuff so rich as they had, and, therefore, to keep up their quantities more stamp power must be procured.

On the motion of Mr. SHILSON, it was decided that this matter should be left in Captain Teague's hands.

Mr. HINGSTON moved a resolution expressive of the respect and admiration which the adventurers must feel for the manner in which their excellent manager had conducted the affairs of the mine. No doubt it had been a matter of enquiry why the meeting had been postponed; but for himself he confessed he had never had any doubt that Captain Teague's reason was quite sufficient, for he gave him credit for never doing anything without an adequate object. (Applause.) Everybody must be satisfied that the dividend of that day was an ample justification for the postponement, and Capt. Teague was certainly entitled to their best thanks. (Applause.)

Mr. LUCAS seconded the motion, which was carried unanimously.

Capt. Teague, in responding, pointed out that not only had they given half-a-crown bonus, but income tax was charged in the accounts to the amount of between 400*l*. and 500*l*. In serving them he served himself. There was nothing taken from the smelters. The extra price of 9*l*. a ton came from the consumers, and they might depend upon it smelters never gave 9*l*. unless they could get 18*l*. by it. (Laughter.)

This concluded the business of Tincroft, and an adjournment was made to Carn Brea.

Capt. TEAGUE reported the accounts of Carn Brea for October, November, and December as follows:—Labour cost, 5594*l*. 7s. 2d.; merchants' bills, 2518*l*. 11s.; dues, 442*l*. 13s.; Vice-Warden's assessment, 9*l*. 7s. 3d.; expenses of procuring a new lease, 112*l*. 15s. 8d.; high rent to Mr. G. L. Basset, 162*l*.; income tax, one year's, 34*l*.; total, 8874*l*. 17s. 8d. The committee, however, had also thought it desirable, subject to the approval of the meeting, to charge 1000*l*. of the cost of the new stamps engine, a great part of which had been delivered, which would make the total cost 9874*l*. 17s. 8d. On the other side they had—Copper ore sold, 224 tons, 1350*l*. 2s. 7d.; black tin, 136 tons 9 dwts. 12½lbs., 12,189*l*. 2s. 6d.; extra carriage black tin, 23*l*. 16s. 2d.; arsenic sold, 49*l*. 4s. 1d.; further proceeds of sale of London office furniture 19*l*.—(applause.)—total, 13,631*l*. 5s. 4d. That would leave, after deducting the 1000*l*., a balance of 3756*l*. 7s. 8d. It would not fall to be observed that more tin had been sold than usual. This would not be the case at the next account; and the object had been to meet the cost of the engine, as they wanted, if possible, to keep the balance in its integrity. That balance was 5148*l*. 12s. 5d., which, added to the balance on the three month's working, left 8905*l*. 0s. 1d. dipposable. They had sold 83 tons of tin at something like 8*l*. a ton increase, which would make 664*l*. The committee suggested that the dividend should be 3*l*. 10s. a share, which would give them 5s. a share out of the 160*l*., and leave the balance intact. (Applause.)

The mine report was exceedingly satisfactory. The driving east of the cross-course winze in the 226 was valued at 150*l*. per fathom.

On the motion of Mr. HINGSTON and Mr. BOLTHO, the reports were adopted and the dividend declared.

Capt. TEAGUE remarked that the deepest part of the mine was also the best, and that at the 236 fm. level there was a very fine-looking lode. All the principal levels upon the lode had been similar to that in adjoining mines; with this difference, that at Cook's Kitchen and Tincroft the copper ore left the lode earlier. At Tincroft the copper left it at the 120, but in Carn Brea they had it down to the 200, and in the bottom end they had none at all. They never was very productive for tin in Tincroft until the lode left the copper. This was an important point, and, therefore, he desired to explain it to them.

On the motion of Mr. SHILSON and Mr. KENDALL, a warm vote of thanks was carried to Capt. Teague for his admirable management.

Capt. TEAGUE, in his reply, pointed out that the reports were exceedingly satisfactory, because they had not only paid 1000*l*. towards the engine—on which 840*l*. would be due—but had paid nearly another 300*l*. for the new lease and the high rent, &c. The next meeting would, he hoped, be held at its proper time, about the last day of May. They would not receive any benefit from the new engine by that date, but he hoped it would then be at work. He might remark also that, of course, they were not working Barncoose for nothing. They had had some returns, but the mine had been drained out, and would take another month or two to get the water all in fork. However, it was in a very fair way.

[For remainder of Meetings see to-day's Journal.]

FLEXIBLE MARBLE.—Mr. J. A HOLLIDAY, of Wheeling, describes a flexible marble slab, which is procured from the Portland Quarries, Vermont. Prof. Hay, of the Western University, of Pennsylvania, describes its constitution as—carbonate of lime, 97·50; magnesia, a trace; silica, 2·05; water, ·45; —100. The above composition and its crystalline character together proclaim it to be a true marble, and, at the same time, a pretty pure specimen of that mineral. The indubitable flexibility of the slab is its most remarkable feature. Dana states that "some of the West Stockbride marble is flexible in thin pieces when first taken out." The slab in the possession of Mr. Holliday is about 2 in. thick, and is nearly as flexible as an equal thickness of vulcanised India-rubber."

CONSUMING SMOKE.—At the back end of the fire-bars, and in front of the ordinary bridge, Messrs. SMITH and LEECH, of Rochdale, form a wall or false bridge of fire-brick, about 18 in. thick, and considerably lower than the former, leaving an air space or chamber of about 6 in. between it and the ordinary bridge, communication being left open between the said air space and the ashpit. The top of this air space is provided with bars of iron, or with a grating or perforations to allow the air to enter the furnace between the two bridges, and mingle with the gases and smoke, so as to assist the combustion at this point.

UTILISING WASTE PRODUCTS.—Mr. THOMAS ROWAN, of Glasgow, manufacturing chemist, has patented some improvements in utilising bi-products obtained in the manufacture of alkali, and in treating cupreous and other metallic solutions and compounds. Hydrochloric acid is added to alkali waste and causes the separation of sulphuretted hydrogen, or the sulphuretted hydrogen may be separated by treating the alkali waste with steam. The sulphuretted hydrogen is passed through the solutions of copper, whereupon the copper, arsenic, and other metals in solution will be precipitated as sulphides. The precipitated metallic sulphides may be roasted, when copper oxide will be left, arsenic and other volatile metals passing off with the sulphurous acid. When the copper solution has been obtained by dissolving the mixture obtained by roasting copper ore and common salt, sulphate of soda will be left. In a similar way the sulphuretted hydrogen obtained as hereinbefore described may be used for precipitating other metals as sulphides. Or, instead of roasting the copper or other metallic sulphides it may be treated with steam, whereby copper oxide will be formed, and sulphuretted hydrogen will be driven off, and the latter may be used for precipitating fresh quantities of copper or other metals.

CHLORATES.—Mr. WALTER WELDON, the Cedars, Putney, has patented some improvements in the manufacture of chlorate of potash, and other chlorates. This invention consists in substituting either magnesia or alumina for the lime which is at present employed in the manufacture of chlorates, so as to obtain a residual product consisting of either chloride of magnesium or chloride of aluminium, or a mixture of both those chlorides; in then decomposing by heat this residual product, so as to obtain its chlorine in a useful form, and at the same time to obtain magnesia or alumina for use again; and in combining the above described method of manufacturing chlorates with the production of the chlorine employed therein, by means of oxides of manganese regenerated by means of magnesia. This invention thus enables all the reagents employed in the manufacture of chlorates to be used over and over again.

FOREIGN MINING AND METALLURGY.

The upward tendency in prices appears to have acquired a fresh impetus in Belgium. No. 1 iron has realised 8*l*. 12s.; and No. 2, 9*l*. 4s. per ton. Refining pig, as had been anticipated, has attained a quotation of 4*l*. per ton, and has even exceeded that high point, contracts having been concluded at Charleroi at 4*l*. 2s. per ton. Rails are dealt in at 9*l*. 4s. to 9*l*. 12s. per ton; they were considered dear a few months since at 7*l*. per ton. The remarkable advance indicated by this comparison appears to have been general in England and Europe. The orders given out in spring have something to do with it, but the principal cause of the advance is the scarcity of raw materiel. This scarcity appears, however, to be somewhat exaggerated, and the hope of an advance in iron assists in supporting the prices of raw materials very considerably. The demand for iron is very active in Belgium, and the production is likewise equally active. The general activity is reflected in the statistics which Belgian officials have now made up in illustration of Belgian commerce during 1871. Thus the imports of rough pig increased last year about 5 per cent, having risen from 82,000 tons in 1870 to 86,000 tons in 1871. The imports of iron generally into Belgium last year would appear to have increased to the extent of about 4½ per cent.; larger imports were made last year from Sweden and England, and the receipts from France and the Low Countries presented a falling off. The exports of steel in bars from Belgium, which stood at only 320 tons in 1870, increased last year to 4000 tons, of which 2200 tons went to Turkey, principally, of course, for Turkish railways. The exports of Belgian steel to England last year amounted to 653 tons, against 3 tons in 1870. The exports of Belgian steel to France declined last year. As regards the exports of Belgian iron generally, they amounted last year to 259,000 tons, against 250,000 tons in 1870. Some of the countries importing Belgian iron present, however, rather notable differences. Thus Russia, which took 64,000 tons of Belgian iron in 1870, imported 22,500 tons in 1871. The Zollverein took 96,000 tons in 1871, against 58,000 tons in 1870. The exports to France fell off 4000 tons, and those to the Low Countries 7000 tons. The exports of Belgian iron to Austria amounted last year to 14,000 tons, while they were only 1300 tons in 1870, The exports of Belgian iron to the United States increased last year to 18,000 tons, as compared with 11,000 tons in 1870.

There is very marked activity in the French iron trade. The rise in prices is very considerable, and consumers and producers appear to be struggling to show which can outvie the other. In the Haute-Marne some new furnaces are being lighted. The Eurville forges have leased the Thomance furnace, and the Closmortier Works the Crassées St. Dizier furnace. In the Meurthe and the Moselle all the works which had become idle have resumed operations, and everyone appears to be working with ardour. In the Nord merchants' iron has made 9*l*. to 9*l*. 4s. per ton at the works; plates, 12*l*. per ton; boiler-plates, 12*l*. 16s. per ton. Coke-made iron has been carried in the Haute-Marne as high as 9*l*. 4s. per ton; machine iron is worth 11*l*. 4s. per ton; hammered iron is quoted at the same rate; and axles are dealt in at 11*l*. 12s. per ton. Pig-iron is no longer quoted at 3*l*. 12s., but at 3*l*. 14s., and even 3*l*. 16s. per ton. Having regard to the rates current in other countries, it does not appear unlikely that French quotations will yet be carried to a higher point. As regards the "annexed" forges, their position is truly exceptional; business has been done at 10*l*. 8s. to 10*l*. 16s. per ton, delivered free at Metz. The iron of Alsace and Lorraine appears, indeed, to triumph easily over German iron, which has to sustain a serious competition, in consequence of the absorption of old French industrials into the German empire. The Laclede Works, at St. Louis, have been making experiments with petroleum as a combustible.

The state of the Paris coal trade has been improving, from a consumers' point of view. Supplies have been increasing of late. With the approach of spring the demand for domestic descriptions of coal has fallen off, but industrial qualities have been in great demand. The advance in the Belgian coal trade appears to be checked, but the trade still displays great activity. The imports of coal into Belgium last year have been returned at 201,653 tons, as compared with 220,656 tons in 1870. The imports of English and German coal appear to have especially fallen off last year. The imports of coke, always feeble, also seem to have further declined last year, having been only 2930 tons in 1871, against 8108 tons in 1870. The exports of coal from Belgium amounted last year to 3,669,227 tons, against 3,175,828 tons in 1870. The exports to the Zollverein were last year 67,000 tons, instead of 36,000 tons in 1870. To the Low Countries 353,000 tons were sent, against 237,000 tons in 1870. France took 3,246,000 tons, against 2,898,000 tons in 1870. The exports of coke from Belgium receded last year to 489,000 tons, against 576,000 tons in 1870.

Advices from Berlin state that the advance in prices still continues upon the German markets. English and Scotch pig, which is now consumed in Germany to a rather considerable extent, has become considerably dearer. Rolled and other descriptions of iron remain firm. As regards coal the market is quiet, and prices have not varied. These two different results—an advance in iron and dulness in the coal trade—must be attributed to one and the same cause, the approach of spring, which has given a fresh activity to metallurgical affairs. Adjudications for railway plant continue to communicate firmness to affairs. Herr Schithan, of Elbing, has secured a contract for passenger locomotives for the Hanoverian Railway, and Herr Hagans, of Erfurth, has also secured an order for goods locomotives for the same system; he would, however, only undertake to deliver four engines. What has been remarked of late is the complete absence of foreign competition for German contracts. All the various German metallurgical centres are in full activity, and excellent dividends have been distributed. A Prague Forges Company has been formed, with a capital of 200,000*l*., in shares of 20*l*. each, which are to be paid up at once to the extent of one-half. Everywhere capital is being turned in the direction of metallurgical investments.

The French copper markets display advancing tendencies. At Paris an advance of 3*l*. per ton has been established in Chilian bars, 2*l*. in ingots, and 1*l*. per ton in English and Corocoro minerals. Chilian in bars has been done at 90*l*. per ton, ingots at 94*l*. per ton, tough English at 92*l*. per ton, and Corocoro minerals (pure standard) at 90*l*. per ton. Advices from Havre indicate higher rates, and more sustained transactions. The German copper markets have been also tending upwards. An advance of 4*l*. per ton has been established in tin at Paris. As regards English tin, the rise appears to be still more considerable. Banca delivered at Havre or Paris has made 162*l*. per ton; Straits, 158*l*. per ton; and English, delivered at Rouen, 158*l*. per ton. Tin has been very firm at Marseilles, and prices have displayed an upward tendency. Upon the German markets an upward tendency has also prevailed. At Rotterdam the announcement of a public sale of 55,000 ingots of tin on April 11 has occasioned a strong upward movement in the market; Banca has brought 93 fls., and Billiton 91½ fls. to 92 fls. At Amsterdam disposable Banca has realised 93 fls.; lots to be delivered in the course of the spring have brought 93½ fls. Lead has been rather quiet upon the French markets; nevertheless, French has risen about 8s. per ton, being quoted

at Paris at 19*l.* 16*s.*, while Spanish has brought 19*l.* 10*s.* per ton. At Marseilles lead in saumons, first fusion, has brought 18*l.* to 18*l.* 4*s.* per ton; ditto, second fusion, 17*l.* 12*s.* per ton; the demand is not very considerable, but prices are well supported. At Rotterdam, Spanish lead has made 11¾ fls.; Stolberg and Eschweiler, 12⅛ fls.; and German of various marks, 12 fls. to 12¼ fls. Zinc is nearly stationary; at Paris, Silesian and other good marks have receded to 23*l.* 12*s.* per per ton. At Breslau there have been, however, numerous transactions in zinc, and the article displays a favourable tendency.

BULLION PRODUCT IN NEVADA FOR 1871.

When we predicted more than a year ago, that the bullion product of Nevada for 1871 would exceed $20,000,000, most of the journals of California treated the assumption as a pleasant piece of bombast. The complete figures were not before us, but from a carefully prepared statement by the general agent of Wells, Fargo, and Co., we are satisfied that the bullion product of Nevada, amounted to not less than $25,000,000 during the year 1871. This equals the gold product of California, and henceforth we shall claim for this State the first rank as the gold and silver producing commonwealth of the republic. Assuming the product to be $25,000,000, and a simple calculation shows that $536 in gold and silver was extracted from the earth, and put in circulation by every man, woman and child in the State. The amounts shipped by Wells, Fargo and Co. from six of the principal districts of the State during the year 1871, are as follows:—

Place.	Amount.
Virginia and Gold Hill	$11,053,328 28
Pioche	3,982,227 89
Eureka	2,173,105·50
Hamilton and Treasure Hill	1,339,420·33
Austin	965,536·17
Mineral Hill	701,014·00
Total	$20,214,632·17

It is well known that the product of the mines of Virginia and Gold Hill, in 1871, was considerably in excess of $11,053,328. The yield, as shown by the books of the county assessor, exceeded this amount by about $2,000,000. The statement of the general agent of Wells, Fargo, and Co. was doubtless compiled from the shipments by that company, and does not embrace a number of districts from which very considerable amounts of bullion were taken in 1871. A large amount of base bullion has been shipped directly to the East for separation from the eastern counties of the State. Much of this is not included in the statement referred to, as it was not shipped through Wells, Fargo, and Co. It is, therefore, reasonable to assume that the gold and silver product of Nevada for 1871 was all of $25,000,000, and that for 1872 it will exceed this amount by $5,000,000.
—Virginia City (Nev.), *Enterprise*.

EXTENSIVE MINING IMPROVEMENTS—LARGEST PUMPING MACHINERY IN THE COAL REGIONS.

Ashland is situated in about the centre of the great Mahanoy Coal Field, and at the point where the coal formation probably reaches its greatest depth, estimated to be from 2000 to 3000 feet. The Tunnel Colliery is situated on the north dip of the Mahanoy mountain. The mine workings are on the Mammoth vein. It has recently become the property of the Philadelphia and Reading Coal and Iron Company by means of the late purchases, including other collieries, and nearly all the anthracite-bearing lands in this vicinity. By reason of these purchases, and from the fact of there being but one owner, consolidation of collieries is possible and concentration of machinery at fewer places. Such has been the case here. The Pioneer, the nearest colliery to the west, on the same vein and dip, has been partially abandoned, it being the intention to take out the coal and pump its water at the Tunnel Colliery.

This brings us to the consideration of the subject of this article, the erection of powerful pumping machinery to take out the combined water product of these two collieries. A brief description of the Tunnel Colliery, its size, openings, character of veins and dip, will give a better idea of the work to be done. The openings consist of a hoisting slope on the Mammoth vein, 825 feet long; a similar one on the Holmes vein, 675 feet long; and a pumping slope on the same vein, 710 feet long. They follow the vein, starting on a dip of 55°, steepening to 68° at the bottom. The Mammoth vein is 25 feet thick; the Holmes vein 6 ft., and overlies the Mammoth about 150 feet. The slopes are sunk to the same level and connected below by means of two rock tunnels. The gangways have a run east and west a combined distance of over 2½ miles. The estimated amount of water to be pumped, with the present depth and lateral openings, is about 2000 gallons per minute. This will be somewhat increased as the gangways extend. The perpendicular height water has to be lifted is 602 feet, from gangway level to discharge line of Mahanoy creek. This is divided into two lifts of 301 feet each. To pump this water two Cornish pumping-engines are being erected, cylinders 80 in. in diameter, 10-feet stroke. Two plunger-pumps are being placed on each lift, 24-inch working barrels. The engines are to be so arranged that each pump will discharge alternately, thus using but one water column, and making the discharge continuous. The arrangement then is this. The boilers and engines by which the power is developed and applied, are separated a greater or less distance from the pumps, the point at which the work is to be done, the force being conveyed by means of wooden rods; the engines lifting the rods and plunger, at the same time filling the pump with water by suction, the rods then falling by their own weight and forcing the water to flow up the column pipe to its discharge.

The application of steam power is a simple one, but admits of much contrivance and ingenuity in the details. In such a case as the present one, with the large amount of water to be pumped, the long lifts and steep dips, it necessitates uncommon strength in the parts and well secured foundations to resist the enormous strain. The engine foundations are of cut stone and rubble masonry, 20 feet deep, 27 feet long, and 32 feet wide. The weight of masonry is about 1000 tons. The engine cylinders are placed on an angle of 54°. The bed plates are secured to masonry by 32 bolts, 2 in. in diameter, 13 feet long. The weight of the engines is 167,400 lbs. The cylinders weigh 2000 lbs. each. The pump-plungers 6000 lbs each. The pump and column weigh 141,240 lbs. Total weight of engines, pumps and column, 308,640 lbs. The upper set of pumps are placed on an angle of 62°, the lower of 68°. The capacity of the four pumps to be put in at present will be, at 6½ strokes of engines per minute, 2937 gallons per minute, the water being lifted 602 feet. The capacity of the engines for one lift of 301 feet, at the same rate of speed, is over 12,000 gallons per minute.

Comparing this capacity with that of other large pumping machinery, the largest of which is the engine lately erected at the Lehigh Zinc Mines, with a cylinder of 110¾ in. in diameter, length of stroke 10 feet, and estimated capacity of 12,000 gallons per minutes for lift of 300 feet [full details of which were given in the Supplement to the *Mining Journal* of Feb. 24] it will be seen that it is equally large, if not slightly in excess. The machinery also compares favourably with the above, in having the advantage of simplicity, hence smaller cost in operating, in equal capacity, with a saving of nearly six-sevenths in the weight of iron in engines, giving a great difference in first cost. The pumping slope varies in size, being 26 feet wide, and 10 feet high at the largest point. The work has been driven from both ends, the line being preserved by means of surveys, carried from the starting point on surface, down main slope on Mammoth vein, along gangway, through tunnel to Holmes vein, and along it to a point on extension of line from above. This was work requiring the utmost care to assure accuracy, the line being carried a distance of over 2500 feet, part of the distance down an inclination of nearly 70°, and then openings varying from 10 to 3 feet in height. The difficulties and liabilities to mistakes in an engineer's work are manifold when he operates on horizontal *terra firma*, but they are increased tenfold when his work has to be done suspended, as it were, in mid-air, with the plane of operations lacking but 20° of the vertical.

These improvements, and in fact all others now in progress by the company, are of the most permanent character. The machinery is intended to do the work of successive lifts of 300 feet to be sunk hereafter. The present depth commands a coal area sufficient to produce about 4,400,000 tons, but with the present wasteful system of mining now in vogue throughout the American coal fields, it is not probable that more than 50 per cent. of this quantity will be obtained—say, 2,200,000, or enough for yearly shipment of 100,000 tons for 22 years. A Guibal fan for ventilating purposes is being erected, to be 18 feet in diameter, paddles 6 feet wide, the casing, paddles, &c., all to be of iron. The supply steam for pumping, hoisting, and running fan requires 40 boilers. The pumping-engines are built by Geo. W. Snyder, of Pottsville, under the direction of Mr. S. B. Whiting, superintendent. LEWIS A. RILEY, Mining Engineer.
—*United States Railroad and Mining Register*, March 9.

FOREIGN MINES.

EMMA.—The directors have announced a fifth monthly interim dividend, at the rate of 18 per cent. per annum, payable on the 1st prox.

DON PEDRO NORTH DEL REY.—Telegram from Lisbon:—Produce to Feb. 29, 7354 oits.; estimate for February, 9300 oits.

ALMADA AND TIRITO (Telegram).—Clemes, Feb. 7: "Doing much better than previously; increased yield and ley Patio ores. Docile ores fit for amalgamation. Black ores increasing."

SOUTH AURORA.—The directors have received per steamer Westphalia, eight bars of silver from their mines, value $8619 99-100.

SWEETLAND CREEK (Gold).—G. D. McLean, March 25: We have cleaned up after a run of 46 days. The gross returns are $20,500; the profit is $9900. I have besides paid $2000 for powder. The tunnel cost is $1400. I send you a remittance of $8500.

G. D. McLean, March 4: I am gratified to know the directors are pleased with the progress of the new tunnel. I am making every effort to urge it along, and we are making more rapid progress than ever made on this ridge before. I have commenced to sink the shaft from which to drive two other faces; this, of course, causes extra expense, but I think by not sparing expense, and without greatly increasing it after the shaft is down and driving commenced, I can finish excavating in six months.

PACIFIC.—Capt. Prideaux, March 5: Since my last report we have raised from the mine 20 tons of ore, 15 tons of which came from the Batters' ledge. The first-class, 2 tons, estimated value $1200 per ton; second-class, 8 tons, estimated value $500 per ton; third-class, 10 tons, estimated value $150 per ton.—Batters' Ledge: Here we have let two stopes on contract, four men to each stope at $30, or 6*l.* per fathom. In these stopes the ledge is on an average 1½ ft. wide, and contains ruby, black sulphurets, and stephanite of silver, which is very rich. The ledge in the drift below these stopes (400 ft. level) is improving daily, and I have no doubt but that this drift will soon be in the same quality of ore as in the stopes. The cross-cuts are being pushed ahead with all speed, especially at the 550 north level. There is nothing calling for particular notice in any other part of the mine.

UTAH (Silver).—The superintendent was making good progress in the construction of the calciners, and the grading for the hoisting machinery was nearly completed. The mines are reported as looking well, and with plenty of ore the superintendent anticipates having profitable results during the ensuing summer.

BATTLE MOUNTAIN.—Capt. Richards reports, under date Feb. 29: Virgin: The cross-cut eastward towards Lake Superior is in hard ground, composed principally of iron pyrites, but I hope and think it will improve ere long. The stopes in the back of the 113, south of Roach's winze, are turning out fair quantities of ore of improved quality compared to that shipped in December and January, which, owing to a poor shift of ground, materially lessened the quality. In the 73 north, on the eastern side of the drift, the lode is large and orey, but of low quality. Thomas's rise, in the back of the 73 north, has been—as before advised—communicated with the 37, increasing the ventilation (always a very important thing in mining), and laying open some good ore.—Lake Superior: The 135 ft. level south is being extended on the course of the lode, which is of a very promising character, and producing some good pay ore, but its containing iron pyrites deteriorates its value; it is a fine strong lode: 460 sacks have been raised during the week, and there are 3309 sacks at San Francisco awaiting shipment.

YORKE PENINSULA.—The directors announce that the full amount of 3550*l.* of the debentures proposed to be issued has been subscribed for, and that instructions have been sent to the committee at Adelaide to continue operations at the Kurilla Mine.

WEST CANADA.—Feb. 21: Wellington: The two stopes in the bottom of the 40, east of Rowe's shaft, will yield 2½ and 3 tons of ore per fathom.—Huron Copper Bay: At Bray's shaft all the necessary timber is put in, and the men began to sink under the 60 fm. level on the 19th inst; the lode here looks promising. The 60 fm. level, east of Bray's shaft, has just reached the boundary. The lode is yielding about 1 ton of ore per fathom. There is no change in the ground in the cross-cut driving north at the 50, west of Palmer's shaft. The stope in the back of the 60, east of Bray's, is yielding 2½ tons per fathom. The stope in the bottom of the 50, west of Palmer's shaft, also yields 2½ tons per fathom; and that in the bottom of the 35, west of the same shaft, 3 tons per fathom. Two stopes below the 35, east of Bray's, yield 2½ tons per fathom each; and one on the Fire lode under the same level, 2½ tons per fm. The stope in the bottom of the 20, east of new engine-shaft, yields 2 tons per fm.

EAST SHEBOYGAN.—The following is from the *White Pine Daily News*, Feb. 17: "There is but little change in the East Sheboygan Company's Mines since our last report. Working the usual force of men on the East Sheboygan, and hoisting to the dumps. The most of the force of men is employed in prospecting and making openings.—Feb. 24: The East Sheboygan Company's Mines are looking well. Since last report a cross-cut has been opened opposite the south-east drift, in which there are good indications of meeting ore in that direction. The Regent drift is down to the face of the hill, and the ore can be run out from the breasts, saving the expense of hoisting. The most of the force of men are engaged prospecting and making openings. At Copper Silver Glance a shift of two men is engaged sinking the north shaft. The indications for finding a good body of ore are encouraging. The *Wall-street Journal* of 2nd inst., contains a letter from their correspondent in Treasure City, dated Feb. 10, from which we extract the following:—"The East Sheboygan Mine is looking finely. A body of ore, varying from 8 to 12 feet in thickness, and 300 feet in length, has been exposed in the underground works. Much of this ore is high grade, and will pay well for milling. This company has lately purchased the Copper Silver Glance Mine, situated on the east side of Mahogany Canon, ¼ of a mile south-east of the Eberhardt."—[We understand from the secretary that there are nearly 1400 tons of ore on the dumps ready for milling as soon as the ground is sufficiently clear of snow to allow it be hauled to the reduction works.]

MR. HENRY GIBSON IN HIS NATIVE TOWN.

A grand dinner, in honour of Mr. Henry Gibson's visit to his native town of Portsmouth, was given in the new and spacious assembly rooms of the Royal Oak Hotel, on Thursday evening, when a numerous company of the most influential inhabitants of the borough and locality sat down to a well-served dinner. Mr. T. HINTON occupied the chair, and Mr. W. GUNNELL the vice-chair. The magnificent band of the naval commander-in-chief (Admiral Sir George Rodney Mundy, K.C.B.) were stationed in an anti-room, and charmed the company with the performance of a well-selected programme of operatic and general music. The room was very profusely decorated with flags and mottoes. On the removal of the cloth,

The CHAIRMAN proposed the health of the Queen and the various members of the Royal Family. In doing so, he remarked that this toast was peculiarly acceptable at the present moment, seeing that the general feeling of the country which had been expressed in favour of the reigning house of Brunswick, a feeling which, while it had possibly been allowed to become, to a certain degree, dormant in the hearts of our countrymen, had, with the alarming illness of the heir to the Crown, fanned itself into the bright and effulgent light of love for the lady who ruled over a land wherein happiness and prosperity reigned supreme, and of love for the Prince who had passed through an affliction of the most intense character. (Cheers.) He had been induced to deviate from the strict rules laid down by the various toastmasters of the day, and would call upon the company to combine what usually was made to extend over two toasts, and to drink with that enthusiasm which characterised Englishmen the health of Her Majesty and the members of the Royal Family.

The toast was received with loud bursts of applause.

The CHAIRMAN next gave—"The Army, Navy, and Reserve Forces," which was responded to. He (the Chairman), in proposing the health of the worthy host, Mr. Henry Gibson, said the majority of the guests present had known that gentleman for many years, during the whole of which time they had found him ever amongst them during his sojourn in this his native town, where he sought to recruit that strength which his laborious studies in the great and unfathomable world of science, prosecuted by him in nearly every known country of the earth, shattered relentlessly, together with his wondrously strong and eminently clear perceptions of the bountifully rich contents of the inexhaustible bowels of this wonderfully great island. (Applause.) He (Mr. Gibson) had ever been foremost in kind acts, and those who found it impossible to help themselves had always experienced the utmost kindness and liberality at his hands. (Hear, hear, and a voice, "I know that well.") In reference to this meeting, he might say that he had received letters from several of the most distinguished inhabitants of this important, ancient, and loyal municipality, in which the writers expressed their most profound regret that illness in some cases, and prior engagements in others, precluded the possibility of their being present. Among these he might mention the Messrs. H. and R. W. Ford. Dr. Parson (the President of the Liberal Association), Mr. James Michael Williams (the eminent printer, of Portsmouth, and the Vice-President of the Liberal Association), and many others. He (Mr. Gibson) would explain more fully than he (the Chairman) could the various details in connection with the great copper mine of Panty-Gaseg, the opening of which was celebrated about a week ago. He had received a manuscript report of the opening of the mine, and in this a most excellent account was given of the proceedings connected with the ceremony, and of the miners' dinner. As he could tell from the report, many of the speeches were delivered in the Welsh language, and hence the reason that they did not appear at length in the London daily papers. The magnitude of the undertaking in which Mr. Gibson had now engaged was vast in the extreme, and he was prepared to say, from evidence of the highest possible character, that the mine in question was rich beyond description, and opened up a great and lucrative field for the calculating speculator. (Hear, hear.) The large number of friends who had gathered round Mr. Gibson that evening, for the purpose of congratulating him upon his successful negociations for the taking of the Panty-Gaseg Mine, must prove, beyond mere words, the heartiness of their friendship for him, and the genuineness of their sympathy in his great and profitable enterprise. (Cheers.) Mr. Gibson, although strong as far as experience and capital were concerned, was backed by a large number of the most influential capitalists in this and other countries, whose names, were he (the Chairman) in a position to mention them, would astound the company. Without further preface, he would propose "Health and prosperity to Mr. Gibson."

The toast was drunk in bumpers, with the heartiest enthusiasm, and at the conclusion of the three times three cheers, which were given with an echo seldom heard at similar gatherings, the band took up the time-honoured accompaniment for all principal toasts—"For he's a jolly good fellow," the company giving the words with a zest that must have struck home to the heart of him in whose honour they were sung.

Mr. GIBSON rose to respond, amid a perfect storm of applause. He commenced by saying that he was a native of this town, and although he had been absent from it for many years he had always cherished it in his memory with the fondest recollections. The great question of mining had attracted his attention during a very great portion of his life; in fact, during a whole quarter of a century. In the year 1852 he had given a grand *fete champetre* in Ireland to celebrate the opening of a mine there, at which *fete* no less than 60,000 guests of various grades and positions were entertained. He mentioned this fact in order to show that his mining speculations had not been of a minor character, but on a grand scale. Mining had always been the chief support of this great country, and great were the opportunities which everywhere presented themselves for the development of the various mines in the country. (Hear, hear.) Indeed, he might say that so large was the demand for iron and other minerals that the ironmasters would not take orders for iron for the next four months. This mine of Panty-Gaseg was rich beyond measure, and offered a scope for the speculator which it was hardly possible to excel; but he further stated that he never wished anyone to embark in any speculation without due consideration, for no man could see 6 ft. into the bowels of the earth any more than another, but still Nature had given such surface indications that it enabled the practical miner to know that operations were worthy of being undertaken in given spots, and our School of Mines had followed up and given such instruction to youth as enabled them to thoroughly verify the theory with practice; and, in conclusion, he was always desirous that those who might wish to join in any of his enterprises to first mark on the margin of their cheque books "doubtful," so as not to be disappointed; and if the project turned out successful he wanted no thanks, and if otherwise no rebukes. He resumed his seat amid uproarious cheering, when the band struck up the favourite national ballad, "The Fine Old English Gentleman," when every member of the company heartily joined in with a full and spirited chorus.

The VICE-CHAIRMAN, in a neat speech, proposed the health of Mrs. Gibson, and in doing so alluded in highly eulogistic terms to Mr. Gibson, and to his estimable lady, the latter of whom he said was always to be found among the poor and needy, with whom she was surrounded, and was ever foremost in the various charities of the country. (Applause.) He had known Mr. and Mrs. Gibson for a number of years, and was in a position to testify to the inestimable worth of both, and hoped he should have the pleasure of meeting them for years to come.

Mr. GIBSON briefly responded, after which the band struck up Sims Reeves's favourite ballad, "My Pretty Jane."

Mr. W. BATCHELOR proposed "Success to the Borough of Portsmouth," coupling with the toast the Mayor and corporation. The Mayor was, he said, a personal friend of his, and he looked upon him as a man well fitted in every way to fill the high and important position he held. Referring to the corporation, he said they had the well-being of the borough at heart, and ably carried out their various duties; but, at the same time, he hoped soon to see them take up the great question of making Portsmouth not only what she was, the greatest naval port in the country, but the greatest commercial and mercantile port for its size and situation. (Cheers.) He went on to refer to the subject of mining, and spoke in flattering terms of the energy displayed by Mr. Gibson in all his transactions, and remarked that if there were a few more speculators like him in Portsmouth it would soon become one of the first ports in the kingdom. Dwelling on the gigantic subject of the innumerable treasures of the country hidden in the bowels of the earth, he illustrated the vast importance of encouraging mining and speculations of all descriptions by dealing in detail with nearly every article on the table, and asked where the comforts and luxuries now enjoyed by the inhabitants of all civilised countries would be but for mining? To illustrate the same, he took up a dessert spoon, then a table knife, then he pointed to the magnificent cut glass of the fruit epergné; but, gentlemen, added he, what poor creatures should we be but for mining, at the same time taking with the end of his knife, some salt from the cellar, and concluded by saying that mining was, if properly carried on, no speculation, but a demonstrated fact.

Mr. GIBSON then rose and proposed the health of his co-adventurers, who entered this speculation with the same ardour as he did himself, being quite contented to row in the same boat, and more especially when they knew that he had engaged a most practical and experienced miner, who would carry out his views to the fullest extent. (Cheers.) As the toast was being drunk the band struck up the air, "We Live and we Love Together."

Several other toasts, including "the Press," were given, and duly responded to, and this happy re-union separated during the early hours of morning.

The greatest credit was due to Mr. James Boyd, of the Royal Oak Hotel, for the elaborate style in which the banquet was served.

METALLIC WIRE GAUZE PACKING RINGS.—Mr. JOHN FLETCHER, Bridgewater-street, Salford, engineer and packing manufacturer, has patented some improvements in packing rings for steam-engine piston-rods, stuffing boxes, pumps, and other similar articles. This invention relates to the mode of manufacturing the packing rings known as "metallic wire gauze packing rings," which are used for packing the pistons and stuffing-boxes of steam-engines, the buckets of air and water-pumps, and for other similar purposes. In carrying out his invention, instead of putting the wire gauze metallic lining (when folded and flattened) half way down the internal surface of the ring and fastening only one side of the ring with one set or row of tongues of gauze wire, the inventor puts the gauze wire all through the whole depth of the ring, and fastens the gauze wire into the ring, as it is being made, with a double set of tongues of wire gauze—that is, two or more sets or rows on each side of the packing ring, which tongues of wire gauze are fastened into the cotton cloth backing, or any other suitable material, such as flax-cloth or flax and cotton webbing, in various widths as the ring is being manufactured, after having rolled up any number of folds of the metallic gauze wire and cotton cloth to make the packing ring to any size required for the packing, and secured it well in with the two rows of tongues. The inventor stitches the ring quite through and all round with copper or any other sort of metal wire, to prevent the gauze from drawing, thus well securing the packing ring in one compact and secure ring.

THE NEW PUDDLING-MACHINE.—It is stated that an agreement has been entered into between Mr. Danks, the inventor of the new puddling machine, and a combination of iron manufacturers representing the different districts, whereby the latter undertake to have 200 furnaces on his plan put up within six months, and in consideration of his permission to do so to pay him 50,000*l.* at that time, whether the furnaces are in operation or not. In most cases this will represent an extension of the puddling power, seeing that the general body of the firms are not going to remove their old hand puddling-furnaces, and this will be equal to an additional make of 300,000 tons per annum. It is intended, on payment of a further sum, to erect 200 more, and this, with the 40 before arranged for, will make something like 450 furnaces added to the producing power of the country in a year or two. This is such a revolution as has never before occurred in the history of this branch of industry, and the more is it to be wondered at when it is remembered that, till July last, it was thought that hand-puddling must for ever continue, every machine to do away with it having before that entirely failed.—*Times*.

COPPER ORES.

Sampled March 6, and sold at the Royal Hotel, Truro, March 21.

Mines.	Tons.	Price.	Mines.	Tons.	Price.
Devon Great Consols	107	£2 3 0	Marke Valley	51	£3 5 6
ditto	101	2 1 0	Brookwood	53	4 15 6
ditto	96	1 19 6	ditto	52	4 1 6
ditto	89	5 5 6	ditto	51	4 1 6
ditto	88	3 0 0	ditto	48	4 15 6
ditto	86	2 1 6	ditto	44	9 12 6
ditto	84	5 1 6	ditto	38	9 4 6
ditto	83	6 11 6	ditto	28	16 3 6
ditto	82	2 1 6	West Maria & Fortes	66	2 17 6
ditto	80	2 7 6	ditto	61	2 1 6
ditto	79	3 18 0	ditto	59	2 3 6
ditto	71	6 15 6	ditto	35	2 3 6
ditto	57	2 16 0	ditto	29	2 9 6
ditto	51	3 1 6	Wheal Friendship	86	8 9 6
ditto	47	1 15 6	ditto	82	2 16 6
ditto	14	1 10 6	ditto	28	17 4 6
ditto	13	10 12 6	East Caradon	61	6 12 6
ditto	10	40 1 6	ditto	50	5 17 6
South Caradon	69	7 9 6	ditto	38	5 6 6
ditto	66	11 8 6	ditto	21	2 15 6
ditto	56	7 2 6	Hingston Down	82	5 12 6
ditto	54	8 7 6	ditto	80	5 10 6
ditto	51	6 8 6	West Caradon	55	3 6 6
ditto	49	14 13 6	ditto	52	4 12 6
ditto	46	10 16 6	ditto	45	5 14 6
ditto	45	7 2 6	Gunnislake (Clitters)	60	4 17 6
Marke Valley	105	3 7 6	ditto	44	4 18 6
ditto	70	4 10 6	Prince of Wales	65	7 1 6
ditto	65	3 13 6	Franco Consols	10	13 14 6
ditto	55	2 15 6	ditto	8	4 18 6
ditto	54	4 0 6	West Rose Down	10	4 18 6

TOTAL PRODUCE.

Devon Great Con.	1238	£4620 0 0	Hingston Down	162	£ 903 5 0
South Caradon	436	3983 8 0	West Caradon	152	679 17 6
Marke Valley	400	1447 0 0	Gunnislake (Clit.)	104	509 4 0
Brookwood	314	2126 15 0	Prince of Wales	65	429 17 6
West Maria, &c.	250	967 17 6	Franco Consols	18	175 13 0
Wh. Friendship	196	1452 9 0	West Rose Down	10	49 5 0
East Caradon	170	956 1 6			

Average standard..... £126 1 0 | Average produce..... 6¾
Average price per ton £5 4 0
Quantity of ore ..... 3515 tons | Quantity of fine copper..221 tons 19 cwts.
Amount of money £18,314 13 0
LAST SALE.—Average standard..... £114 8 0—Average produce..... 7¼
Standard of corresponding sale last month, £123 0 0—Produce, 6⅛.

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Vivian and Sons	565	£2291 12 6
Sims, Willyams, and Co.	373¼	2554 7 3
Williams, Foster, and Co.	1042½	7361 4 9
Mason and Elkington	527½	2614 11 0
Copper Miners' Company	371½	1087 17 9
Charles Lambert	194	658 1 0
Sweetland, Tuttle, and Co.	295¼	1345 3 9
The Bede Metal Company	145½	401 15 0
Total	3515	£18,314 13 0

Copper ores for sale at Tabb's Hotel, Redruth, on Thursday next—Mines and parcels.—West Tolgus 466—South Crofty 269—Crenver and Abraham 262—Carn Brea 218—West Seton 205—East Pool 189—Wheal Seton 171—South Carn Brea 152—Wheal Basset 90—Wheal Jewell 38—Wheal Prosper 15—Wheal Emily Henrietta 11.—Total, 2086 tons.

COPPER ORES.

Sampled March 6, and sold at Swansea March 26.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Cape	70	34½	£31 5 0	Berehaven	75	8⅜	£7 3 0
ditto	70	34½	31 5 0	ditto	63	8¾	7 11 0
ditto	70	34½	30 8 6	ditto	76	9¼	8 9 0
ditto	69	34½	30 14 6	ditto	75	9⅜	8 8 6
ditto	69	34½	30 16 6	Telhadella	15	11½	10 9 0
ditto	69	34½	31 1 6	ditto	14	12¼	10 8 0
ditto	41	53¼	47 5 6	ditto	2	25	22 0 0
ditto	18	37½	33 3 0	Copper Reg.	72	7⅞	6 8 0
ditto	13	40⅞	36 5 6	ditto	70	7⅞	6 6 0
ditto	10	27	23 11 0	Brass Ashes	76	4¼	2 15 6
ditto	5	53¼	47 5 0	ditto	99	4¼	2 15 6
ditto	3	31¾	27 12 6	Copper Slag	67	5⅞	4 6 0
Berehaven	103	7⅜	6 10 6	ditto	25	7¾	5 12 0
ditto	111	8⅞	7 8 0	Copper Reg.	14	44¼	39 6 0

TOTAL PRODUCE.

Cape	507	£16,457 1 0	Brass Ashes	175	£485 12 6
Berehaven	503	3,779 9 0	Copper Slag	92	429 7 0
Telhadella	31	346 7 0	Copper Regulus	14	350 4 0
Copper Regulus	142	901 16 0			

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Copper Miners' Company	140	£4375 0 0
P. Grenfell and Sons	15	156 15 0
Sims, Willyams, and Co.	94	473 7 0
Vivian and Sons	329	2365 8 0
Williams, Foster, and Co.	454½	5747 11 3
Charles Lambert	244½	3961 18 3
Sweetland, Tuttle, and Co.	109	3444 11 6
Landore Copper Company	78	2425 5 6
Total	1464	£22,949 16 6

Copper Ore for sale April 9—Parramatta 48, 47, 46, 45, 49, 48—Yelta 51, 50, 47, 46—Cape Regulus 47, 47, 38, 14—Berehaven 140—Knockmahon 101—Fursden Ore 56, 54—Brass Ashes 97—Copper Slag 110, 18—Copper Regulus 43—Copper Ore 19, 15, 19—Total, 1295 tons.

TOTALS AND AVERAGES.

21 cwts.	Produce.	Price.	Per unit.	Standard.
Whole sale.. 1464	17⅞	£15 13 6	17s. 6¼d.	£109 7 6

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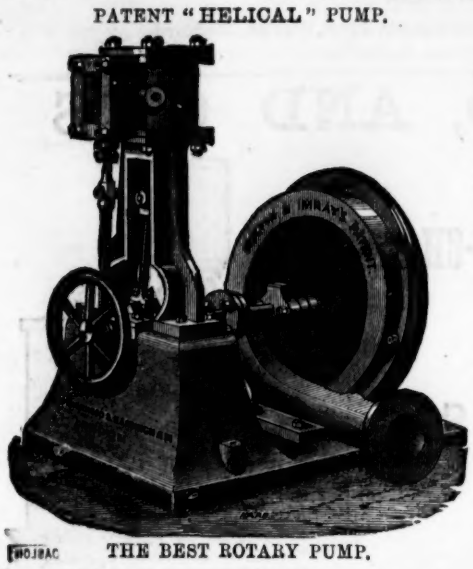

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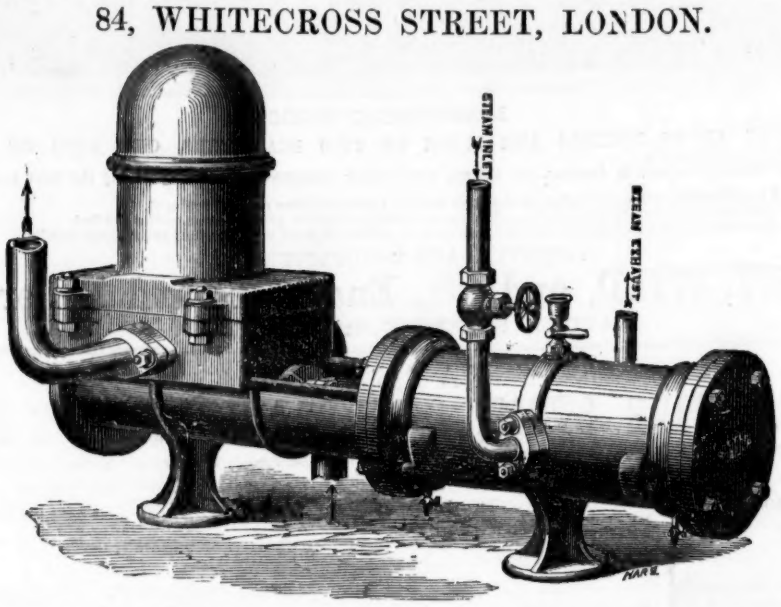

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Extract of a Letter from JOHN SIMPSON, Esq, to Hayward Tyler and Co.'s Agent.

Rhos Llantwit Colliery, Caerphilly, near Cardiff, March 4, 1872.

I should like to have the water-piston and clacks the same as in our present pump, as they work exceedingly well, and I do not think it is possible to improve upon the present pump, except by lining the cylinder with brass as ordered.

BY APPOINTMENT TO HER MOST GRACIOUS MAJESTY THE QUEEN.

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BOILER EXPLOSIONS AVOIDED BY USING PAYNE'S ANTI-CORROSIVE FLUID.

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[CERTIFICATE.]

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"DEAR SIR,—I have minutely examined your Anti-Corrosive Preparation, and can state with confidence that in no way is it injurious to iron or brass. It is inodorous and perfectly harmless, even when swallowed. T. R. L. HOOPER, M.R.C.S.L.

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For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

"I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.

"The lubricating power of this oil is equal to Sperm or Lard Oil.

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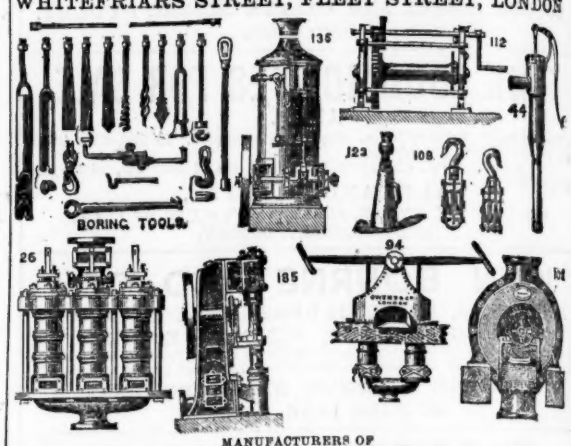

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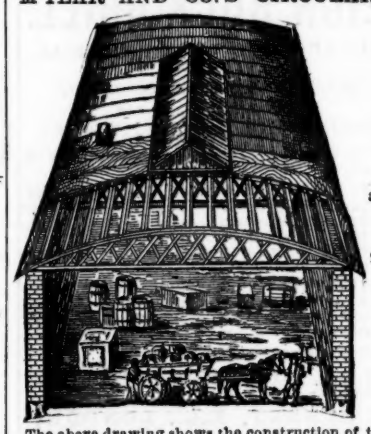

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The above drawing shows the construction of this cheap and handsome roof now much used for covering factories, stores, sheds, farm buildings, &c., the principals of which are double bow and string girders of best pine timber, sheeted with ½ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.

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PATENT PHOSPHORISED PRESERVATIVE AND ELASTIC ENAMEL COMPOSITIONS

FOR PREVENTING FOULING ON SHIPS' BOTTOMS and PRESERVATIVELY COATING EXTERNAL or INTERNAL TIMBER and METALLIC CONSTRUCTION or every kind.

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21, GREAT ST. HELENS, BISHOPSGATE, E.C., LONDON.

London: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*March* 30, 1872.

SUPPLEMENT.

THE MINING JOURNAL,

Railway and Commercial Gazette.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

EXTRACTS FROM DICKER'S "AUSTRALIAN & LONDON GAZETTE."

LONDON, SATURDAY, MARCH 30, 1872.

GOLD AND THE GOLD-FIELDS.

THE mining industry of the colony has been pursued steadily during the past month, and the yields that have been reported are quite equal to those of the preceding month, allowance being made for the liberal holidays taken by all classes in Victoria at the Christmas and New Year's seasons of the year. In the Sandhurst district—which is now the richest quartz-mining gold-field in the world—most excellent returns are recorded by various companies. The success of one of these companies—the Great Extended Hustler's Tribute—from a reef only struck last October, has exceeded anything previously known even in this colony of rich mines; and as the reef from which the large quantities of gold are obtained still continues to be as rich, if not richer, than when first met with, and will probably furnish work for years to come, the mine will doubtless exceed in value any of our other colonial mines, and perhaps any other in the world. The past half-year's progress of this company and their future prospects are concisely and accurately summarized in the following portion of the mining manager's report to the half-yearly meeting:—"On the 20th of June last I commenced sinking the shaft 25 feet from the northern boundary, from 240 feet to 301 feet in depth, and have timbered the same the whole of the depth, and fixed a ladder way from top to bottom. I cut the reef which has proved so extraordinarily rich in gold on the 1st of October, 1871; since that time the level has been driven on the western leg 120 feet, and on the eastern leg 79 feet, and we have continued stoping the whole of the distance. The cap of the reef averages about 23 feet in thickness and 12 feet in height. 1107 tons of quartz had been crushed up to the 31st of December, 1871, which yielded 11,087 oz. 10 dwt. of retorted gold, being an average of over 10 oz. to the ton. The stone continues to look as rich as hitherto, and shows every appearance of permanency." Since the close of last year the returns from this mine have been larger than those recorded above. For the fortnight ending January 27 the yield exceeded all anticipations, being the extraordinary amount of 3900 oz. There are other companies on the same line of reef as the Great Extended Hustler's Tribute, which expect to cut the same rich reef, and are now making every endeavour to reach it. The large returns of the tribute company have greatly increased the value of all the adjoining companies, the shareholders of which are sanguine of meeting the same rich stone as the tribute company have in their claim. In addition to steady returns from many of the older proved quartz claims on Sandhurst, the New Chum and Victoria Tribute and the Shenandoah Company have returned excellent yields during the past month. During one week the former company obtained between 1400 oz. and 1500 oz., and the latter between 500 oz. and 600 oz. These extraordinary successes of different companies in Sandhurst have led to the formation of many new companies, and a great amount of money is now being expended in developing new claims, which, combined with the continuous work performed in the dividend-paying mines, have given such an impetus to mining and business generally on Sandhurst, that it is now one of the most prosperous portions of the colony.

The Walhalla division includes some very good mines. One of these—the Long Tunnel Company—which has furnished splendid yields for a long time back, is considered to be one of the best claims in Victoria. The operations at this mine for the quarter ending the 5th January were thus reported to *The Argus* by the manager, and published in the issue of that journal of the 25th ult:—"The battery has reduced for the quarter, January 5, as follows, viz.:—October—Quartz 1271 tons, yielding amalgam 5605 oz. 10 dwt., gold 2859 oz. 11 dwt., or an average of 2 oz. 4 dwt. 23 gr. per ton. November—Quartz 1402¾ tons, yielding amalgam 5016 oz. 2 dwt., gold 2254 oz. 16 dwt. 12 gr., or an average per ton of 1 oz. 12 dwt. 3 gr. December—Quartz 1090 tons, amalgam 5211½ oz., gold 2546 oz. 1 dwt., average per ton 2 oz. 6 dwt. 17 gr. Total—Quartz 3763¾ tons, amalgam 15,833 oz. 2 dwt., gold 7660 oz. 8 dwt. 12 gr., average per ton 2 oz. 0 dwt. 17 gr. Calcined pyrites treated, 50 tons, yielding 650 oz. 4 dwt. of amalgam, gold 161 oz. 10 dwt., or an average per ton of 3 oz. 4 dwt. 14 gr."

A STROKE OF GOOD FORTUNE.—The *Bendigo Advertiser*, of December 11, relates that an incident of good fortune which occurred on Saturday, reads like a romance, and shows how much of that element pervades the mining world. One of our wealthiest men, Mr. Thompson Moore, M.L.A., was the happy man. On Saturday, Mr. Andrew Williamson, manager of the Commercial Bank, in going over some of the old papers of that establishment, discovered an envelope on which was Mr. Thompson Moore's name, and inside was scrip for 600 Golden Fleece shares. He soon communicated the pleasing intelligence to Mr. Moore, who, we need not say, was vastly pleased at finding himself richer by about 6000*l.* than when he rose in the morning. He had had some idea that he was possessed of 600 Golden Fleece shares which he had purchased at 10*d.* per share, but not finding them anywhere, he thought that he had sold them. The shares carry No. 3 and No. 3 Tributes, so that their value is fully 6*l.* per share. It is unnecessary for us to say that Mr. Moore did the honours of his good fortune in a way creditable to himself, and agreeable to his friends.

BENDIGO MINES.

NORTH JOHNSON'S REEF COMPANY, BENDIGO.—*January* 25.—*Directors' Report.*—Though the past half year has not been marked by such a great measure of success as the preceding one, yet your directors have been enabled to declare three dividends, amounting to 1650*l.*, and at the same time to carry out a great amount of permanent work. Finding the old stopès as they were worked up did not yield so well, your directors felt that it would be greatly for the interest of the company if definite arrangements could be come to with the Johnson's Reef Gold Mines Company to sink their engine-shaft a sufficient depth to thoroughly drain the mine. After some negotiations, in which this company took an active part, the Johnson's Company agreed to sink 100 feet deeper (625 feet in all) on condition that the line subscribed 700*l.* Of this sum the North Johnson's Company have paid 295*l.* The benefit of this arrangement is already manifest, as your directors were at once enabled to resume the sinking of the western shaft from the 437 feet level, also the winze from the same level, which has shown gold pretty freely all the way down. There seems now every probability, judging from the stone in the winze, of the next level equalling, if not exceeding, in richness any yet wrought in the mine. You will find further particulars of the workings in the report of the mining manager. In accordance with the resolution passed at a special meeting of shareholders held in November last year, your directors formed a tribute *pro rata* amongst the shareholders to work the western portion of the claim, through which the Britannia reef runs. In order to secure a still larger extent of ground on the same line, the residence area of Mr. Webster was purchased for the sum of 100*l.* The tribute company let a contract to sink a large shaft to a depth of 100 feet, and are making good progress. The ground now held by them will not in any way interfere with the North Johnson's Company's workings on the Johnson's line of reef. In conclusion your directors have every confidence in being able to resume paying dividends in a few weeks. *Mining Manager's Report.*—During the past half-year there have been raised and crushed 1253 tons of stone, yielding 1003 oz. 17 dwt. 12 gr. of gold. The shaft is now down about 40 feet below the 437 feet level. In sinking we have passed through several spurs, all showing gold. I think in about another week I shall commence a crosscut to the east to cut the main reef, which will give us 50 feet to rise on the north portion of the shaft, and 80 feet on the south. I am also sinking a winze 50 feet north of the shaft, which is now down 25 feet, and the reef in it looks very well. I consider that the prospects of both the shaft and the winze is looking very well for the next level.

HERCULES COMPANY, BENDIGO.—*Jan.* 23.—Since my last report we have been pushing on the bottom drive north and south at the 480 feet level. The north level has been driven 50 feet on the reef, which shows gold. The south level has been extended 67 feet along nice looking stone. The contractors have sunk the centre shaft 5 feet during the fortnight, and the crosscut has been driven about 4 feet. *Mining Manager's Report.*—*Jan.* 16.—In reporting progress of works carried on in your mine during the last six months, there has been a crosscut driven 60 feet east at the 480-feet level, which cut the reef; also a winze has been sunk 40 feet, and connected with the same. The reef at this point being very much mixed with sandstone, made very poor, but driving along the same 30 feet north the sandstone began to cut out, and a little gold is seen in breaking, which greatly improves the prospects of your mine. The sandstone is also cutting out going south, and the quartz looking more regular, being through the break which the Victoria Gold Mines had in their ground, under which they got most of their gold. The old stopes at the 440-feet level are entirely worked out, so our operations are confined to the 480-feet level. We have let a contract for sinking the centre shaft an additional 50 feet, which is progressing favourably. When sunk, and the reef cut at a lower level, I think the future prospects of your mine equal to any in the district, having all the paying runs of stone that the Gold Mines have worked so profitably. There have been poppet-heads erected over the centre shaft, and pullies and runners fixed, new cages, and two new ropes; also, a branch tramway to the machine. A new dam has been constructed, which will hold a supply of water through the summer, and also shoots for conveying the water to the batteries. There have been two new batteries erected; also tailings pump and water pump for engine, the cylinder of engine rebored, new piston supplied, and 500ft. of tailings shoots erected. A new blacksmith's shop has been put up, and additions and alterations to engine-house made. A new spider shaft for winding engine and spider have been supplied, which altogether have caused a heavy expenditure, but with the prospects you have in the deep ground it will repay you well, for yo u

(*Continued on page* 4.)

EXTRACTS FROM DICKER'S AUSTRALIAN AND LONDON GAZETTE.

THE MINING JOURNAL, RAILWAY AND COMMERCIAL GAZETTE.

SATURDAY, MARCH 30th, 1872.

LIST of the PRINCIPAL DIVIDENDS PAID in VICTORIA DURING the MONTH ending DECEMBER 30, 1871.

ALLUVIAL.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Argyle, Linton	0 3 0	Dec. 16	3,200	480 0 0
Band and Albion Consols, Ballarat	0 4 0	,, 9	22,450	4,490 0 0
Band of Hope, Maryborough	0 3 0	,, 16	6,000	900 0 0
	0 2 6	,, 30		750 0 0
Bute, Smythesdale	7 0 0	,, 9	40	280 0 0
Go-ahead, Ballarat	0 10 0	,, 30	600	300 0 0
Golden Gate, Maryborough	0 2 6	,, 9	2,000	250 0 0
Golden Lake, Springdallah	0 7 6	,, 9	4,400	1,650 0 0
Golden Stream, Scarsdale	0 10 0	,, 9	2,000	1,000 0 0
Great Gulf, Ballarat	0 2 6	,, 30	8,000	1,000 0 0
Haddon, Haddon	2 0 0	,, 9	64	128 0 0
	3 0 0	,, 23		192 0 0
Leviathan, Napoleon's	0 15 0	,, 23	2,560	1,920 0 0
Seaham, Maryborough	0 1 0	,, 16	6,000	300 0 0
	0 1 0	,, 30		300 0 0
Try Again, Smythesdale	10 0 0	,, 30	23	230 0 0
Velocipede, Ballarat	0 5 0	,, 16	3,000	750 0 0
				£14,920 0 0

QUARTZ.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Ajax, Alexandra	0 0 3	Dec. 16	10,000	125 0 0
Bellevue, Sandhurst	0 0 2	,, 9	24,000	200 0 0
Central Garden Gully Tribute, Sandhurst	0 6 0	,, 9	2,000	600 0 0
	0 7 0	,, 16		700 0 0
Clunes, Clunes	4 0 0	,, 16	100	400 0 0
Cornish, Daylesford	0 15 0	,, 16	1,300	975 0 0
	0 12 6	,, 30		812 10 0
Costerfield G. and A., Heathcote	0 5 0	,, 30	2,000	500 0 0
Cross Reef, Pleasant Creek	1 0 0	,, 30	10,000	10,000 0 0
Dividend Quartz, Steiglitz	0 12 0	,, 23	3,000	1,800 0 0
Eastwood's Quartz, Sandhurst	2 0 0	,, 16	1,000	2,000 0 0
Ellesmere, Sandhurst	0 0 4	,, 30	14,000	233 6 8
Emerald Isle, Pleasant Creek	2 0 0	,, 30	100	200 0 0
Fenton, Taradale	0 4 3	,, 9	2,500	531 5 0
Freehold United, Hepburn	0 2 0	,, 9	2,400	240 0 0
Garden Gully Tribute, Sandhurst	0 1 0	,, 30	23,750	1,187 10 0
Garden Gully United, Sandhurst	0 0 6	,, 30	26,420	660 10 0
Garden Gully United Tribute, Sandhurst	0 1 6	,, 16	23,877	1,790 15 6
Golden Fleece, Sandhurst	0 1 6	,, 23	20,000	1,500 0 0
Good Hope Tunnelling, Crooked River	0 5 0	,, 9	1,800	450 0 0
Great Extended Hustler's, Sandhurst	0 1 0	,, 30	28,000	1,400 0 0
Great Extended Hustler's Tribute, Sandhurst	0 4 0	,, 9	28,000	5,600 0 0
	0 9 6	,, 23		13,300 0 0
	0 7 6	,, 30		10,500 0 0
Happy Valley, Running Creek	0 5 0	,, 16	3,000	750 0 0
Harbinger, Dry Creek	0 6 0	,, 16	3,200	960 0 0
	0 5 0	,, 30		800 0 0
Hope, Wood's Point	0 1 0	,, 30	12,000	600 0 0
Imperial, Ballarat	1 0 0	,, 16	480	480 0 0
	1 0 0	,, 30		480 0 0
Kitto's Tribute	0 0 3	,, 30	24,000	300 0 0
Lazarus and New Chum, Sandhurst	0 0 6	,, 16	45,000	1,125 0 0
Long Tunnel, Stringer's Creek	3 0 0	,, 9	2,400	7,200 0 0
New Chum and Victoria, Sandhurst	0 0 6	,, 16	26,000	650 0 0
	0 0 9	,, 23		975 0 0
New Chum and Victoria Tribute, Sandhurst	2 10 0	,, 16	800	2,000 0 0
	2 10 0	,, 23		2,000 0 0
New Fear-not, Daylesford	0 1 6	,, 30	3,600	270 0 0
New North Clunes	4 0 0	,, 30	2,056	8,224 0 0
North Cornish, Daylesford	0 3 0	,, 9	3,000	450 0 0
North Gipps Land, Walhalla	0 5 0	,, 16	2,400	600 0 0
North Peg-leg, Sandhurst	0 0 3	,, 30	25,000	312 10 0
Rainbow Tribute, Sandhurst	0 0 6	,, 30	23,750	593 15 0
Rose of Denmark, Sandhurst	0 0 6	,, 30	24,000	600 0 0
Shenandoah New Chum and Bellevue Tribute, Sandhurst	0 0 8	,, 23	24,000	800 0 0
Tommy Dodd, Kyneton	0 0 6	,, 16	10,000	250 0 0
Unity, Sandhurst	0 0 6	,, 23	20,000	500 0 0
Victoria Gold Mines, Sandhurst	0 1 0	,, 9	20,274	1,013 14 0
Victory, Sandhurst	0 0 6	,, 30	30,096	752 8 0
Young Chum, Sandhurst	0 0 6	,, 23	20,000	500 0 0
	0 0 6	,, 30		500 0 0
				£89,392 4 2

Dividends paid by Alluvial Mining Companies	£14,920 0 0
,, ,, Quartz ,, ,,	89,392 4 2
	£104,312 4 2

DURING the MONTH ending JANUARY 27, 1872.

Collingwood and Fitzroy Gas Co., 10 per cent. per ann. and bonus of 1s. per share		£4,500 0 0
Land Mortgage Bank of Australia	10 per cent.	5,000 0 0
Melbourne Gas and Coke Co.	8 per cent.	9,200 0 0
		£18,700 0 0

ALLUVIAL.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Annabella, Huntley	0 1 0	Jan. 20	3,100	155 0 0
Argyle, Linton's	0 3 0	,, 20	3,200	480 0 0
Band and Albion Consols, Ballarat	0 4 0	,, 6	22,450	4,490 0 0
Band of Hope, Maryborough	0 5 0	,, 27	6,000	1,500 0 0
Bute, Smythesdale	4 0 0	,, 6	40	160 0 0
Golden Gate, Springdallah	0 5 0	,, 6	4,400	1,100 0 0
Golden Stream, Scarsdale	0 10 0	,, 6	2,000	1,000 0 0
Haddon, Haddon	2 10 0	,, 6	64	160 0 0
	2 0 0	,, 20		128 0 0
Seaham, Maryborough	0 1 0	,, 13	6,000	300 0 0
Try Again, Smythesdale	4 0 0	,, 27	23	92 0 0
				£9,565 0 0

QUARTZ.

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Central Garden Gully Tribute, Sandhurst	0 6 0	Jan. 13	2,000	600 0 0
	0 4 0	,, 27		400 0 0
Cornish, Daylesford	0 10 0	,, 20	1,300	650 0 0
Costerfield G. & A., Costerfield	0 10 0	,, 27	2,000	1,000 0 0
Eastwood's Quartz, Sandhurst	2 10 0	,, 6	1,000	2,500 0 0
	3 10 0	,, 27		3,500 0 0
Ellesmere, Sandhurst	0 0 4	,, 6	14,000	233 6 8
Empire, Sandhurst	0 0 6	,, 27	24,000	600 0 0
Garden Gully United, Sandhurst	0 0 6	,, 27	26,422	660 11 0
G. G. Consolidated, Sandhurst	0 0 6	,, 6	49,000	1,225 0 0
Golden Fleece, Sandhurst	0 1 0	,, 6	20,000	1,000 0 0
Good Hope Tunnelling and Quartz, Crooked River	0 7 0	,, 13	1,800	630 0 0
Great Extended Hustler's, Sandhurst	0 1 0	,, 13	28,000	1,400 0 0
	0 1 0	,, 27		1,400 0 0
Great Extended Hustler's Tribute, Sandhurst	0 6 6	,, 20	28,000	9,100 0 0
G. V. Brooke Tribute, Sandhurst	0 0 3	,, 6	24,000	300 0 0

QUARTZ—*continued.*

Names of Companies.	Amount per Share.	Date.	No. of Shares.	Dividend.
	£ s. d.			£ s. d.
Harbinger, Dry Creek	0 5 0	,, 6	3,200	800 0 0
Ironbark, Sandhurst	0 1 0	,, 27	9,000	450 0 0
Kitto's Tribute, Sandhurst	0 0 2	,, 27	24,000	200 0 0
Long Tunnel, Stringer's Creek	2 10 0	,, 13	2,400	6,000 0 0
Myrtle Creek, Sandhurst	0 0 4	,, 27	20,000	333 6 8
New Chum and Victoria, Sandhurst	0 1 0	,, 27	26,000	1,300 0 0
New Chum and Victoria Tribute, Sandhurst	5 0 0	,, 20	800	4,000 0 0
New Fear Not, Daylesford	0 1 6	,, 20	3,600	270 0 0
New North Clunes, Clunes	1 0 0	,, 27	2,056	2,056 0 0
North Cross Reef, Pleasant Creek	0 18 0	,, 20	10,000	9,000 0 0
North Gipps Land, Walhalla	0 5 0	,, 13	2,400	600 0 0
North Specimen Hill, Sandhurst	0 0 6	,, 6	30,000	750 0 0
Passby, Sandhurst	125 0 0	,, 6	4	500 0 0
Red Jacket, Bright	0 5 0	,, 27	3,000	750 0 0
Royal Oak, Sandhurst	0 0 6	,, 6	24,000	600 0 0
Shenandoah, New Chum, and Belle Vue Tribute, Sandhurst	0 1 0	,, 27	24,000	1,200 0 0
South Extended Monday, Sandhurst	0 0 3	,, 6	24,000	300 0 0
Victoria Gold Mines, Sandhurst	0 1 0	,, 6	20,274	1,013 14 0
	0 1 0	,, 20		1,013 14 0
Victory, Sandhurst	0 0 6	,, 27	30,096	752 8 0
Young Chum, Sandhurst	0 0 6	,, 27	20,000	500 0 0
				57,588 0 4

Dividends paid by Companies other than mining	18,700 0 0
,, ,, Alluvial Companies	9,565 0 0
,, ,, Quartz ,,	57,588 0 4
	£85,853 0 4

AUSTRALIAN AND NEW ZEALAND DIVIDEND GOLD MINES INVESTMENT COMPANY, LIMITED.

No. 1 SERIES.

No further investments on account of this Series have been made this month. The agent still anticipates that he will be able to invest the balance of the capital to better advantage by waiting a week or so longer.

TOTAL INVESTMENTS.—No. 1 SERIES.—AUSTRALIAN.

Date of Purchase.	Name and Locality of Company.	Number of Shares.	Rate per Share, including all Costs, Charges, &c.	Total Amount.	
			£ s. d.	£ s. d.	£ s. d.
1871.					
Sept. 29	New Moon G. M. Co., Bendigo	120	1 1 1	126 10 0	
Oct. 3	Do. do. do.	100	1 1 1	105 8 4	
					231 18 4
,, 3	Argus Co., Bendigo	100	0 17 2½	86 0 10	
,, 5	Do. do.	200	0 17 2½	172 1 8	
,, 30	Do. do.	300	0 19 5	291 5 0	
					549 7 6
,, 3	Central Energetic G. M. Co., Lauriston	10	9 19 5	99 14 2	
,, 6	Do. do. do. do.	20	9 14 6	194 10 0	
,, 31	Do. do. do. do.	25	9 6 1	232 12 1	
					526 16 3
,, 3	Victoria Gold Mines Co., Bendigo	25	2 19 6	74 7 6	
,, 5	Do. do. do.	100	2 19 6	297 10 0	
					371 17 6
,, 4	North Specimen Hill G. M. Co., Bendigo	400	0 4 10½	509 5 3	
,, 4	Do. do. do. do.	900	0 4 10½		
,, 5	Do. do. do. do.	400	0 4 10½		
,, 7	Do. do. do. do.	400	0 4 10½		
					509 5 3
,, 5	South Moon G. M. Co. (Graham's), Bendigo	500	0 6 6	162 10 0	
Nov. 6	Call on ditto				
					162 10 0
,, 21	Hercules Quartz M. Co., Bendigo	200	2 1 1	410 16 8	410 16 8
,, 21	Rose of Denmark G. M. Co., Bendigo	400	0 18 11	378 6 8	378 6 8
,, 25	Hope G. M. Co., Wood's Point	300	0 15 8	235 0 0	235 0 0
	PURCHASED IN ENGLAND.				
	Mariners' Reef Quartz Mining and Crushing Co., Maryborough	500	1 2 3	556 5 0	556 5 0
	Total Investments to date				£3,932 3 2

Dividends.—No. 1 Series.—The dividends for the month consist of 6*d.* per share North Specimen Hill, and two of 1*s.* each upon Victoria Gold Mines—making in the aggregate, with what has already been received, 118*l.* 14*s.*

INVESTMENTS.—No. 2 SERIES.—NEW ZEALAND.

Date of Purchase.	Name and Locality of Company.	Number of Shares.	Rate per Share, including all Costs, Charges, &c.	Total Amount.	
			£ s. d.	£ s. d.	£ s. d.
1871.					
Nov. 3	Caledonian G. M. Co., Thames River	3	132 4 5	396 13 3	
,, 3	Do. do. do.	1	133 6 8	133 6 8	
					529 19 11
,, 16	Shotover G. M. Co., Thames River	600	0 9 5	282 10 0	282 10 0
,, 16	Golden Crown G. M. Co., Thames River	100	5 11 1	555 8 4	555 8 4
,, 16	Albion G. M. Co., Thames River	107	7 15 7	832 7 5	832 7 5
,, 16	Alburnia G. M. Co., Thames River	18	7 15 7	140 0 0	
,, 16	Do. do. do.	50	8 6 8	416 13 4	
					556 13 10
,, 16	Imperial Crown G. M. Co., Thames River	16	4 14 5	75 10 8	
,, 16	Do. do. do. do.	24	5 0 0	120 0 0	
,, 16	Do. do. do. do.	60	5 11 2	333 10 0	
					529 0 8
,, 16	Prince Imperial G. M. Co., Thames River	10	3 1 2	30 11 8	
,, 16	Do. do. do. do.	89	2 15 7	247 6 11	
					277 18 7
,, 16	Kuranui G. M. Co., Thames River	25	1 18 11	48 12 11	
,, 16	Do. do. do.	50	2 4 5	111 0 10	
,, 16	Do. do. do.	140	2 15 7	389 1 8	
					548 15 5
,, 16	Tokatea Coromandel	115	4 8 10	510 15 10	510 15 10
	Stamps and Transfers				16 10 2
1872.					
Jan. 19	Tookey's, Thames River	13	21 13 4	281 13 4	281 13 4
	Total Investments to date				£4,921 13 10

Dividends.—The total amount received, up to December 22nd ult., at the Bank, was 105*l.* 2*s.* 9*d.*, which included three dividends of 5*l.* each Caledonia, and one of 8*s.* Tokatea.

Note.—Several parcels of these shares have changed hands at 5*s.* premium.

EXTRACTS FROM DICKER'S AUSTRALIAN AND LONDON GAZETTE.

INVESTMENTS.—No. 3 SERIES.—AUSTRALIA.

Date of Purchase.	Name and Locality of Company.	Number of Shares.	Rate per Share, including all Costs, Charges, &c.	Total Amount.		
			£ s. d.	£ s. d.	£ s. d.	
1872.						
Jan. 3	New Moon Co., Bendigo	200	1 3 4	233 6 8		
„ 13	Do. do.	100	1 3 4	116 13 4		
					350 0 0	
„ 12	Hope Mining Co., Wood's Point	200	0 15 0	150 0 0	150 0 0	
„ 12	Hercules Q. M. Co., Bendigo	150	1 16 8	275 0 0		
„ 24	Do. do. do.	50	1 13 11	84 15 10		
					359 15 10	
„ 17	Rose of Denmark Co., Bendigo	200	0 16 8	166 13 4		
„ 19	Do. do do.	100	0 16 8	83 6 8		
					250 0 0	
„ 19	North Johnson's Co., Bendigo	100	1 10 0	150 0 0	150 0 0	
	Total Investments to date ...	-	- -	- -	£1,259 15 10	

THE MINES.

THE WINTER'S FREEHOLD GOLD MINING COMPANY, LIMITED, BALLARAT, *January 31st*, 1872.—*Mine Report, No. 1 Shaft.*—The enclosed gold report will show you that the yield is improving every month. More hands are now being put on, and this week we shall have five additional parties in wash dirt. *No. 2 Shaft.*—The tributors have been engaged upon dead work nearly all the month. They are now getting to work upon the new ground. I mentioned in my last report, on 27th inst., two machines yielded 10 oz. 10 dwts., which is considered satisfactory. We are driving as fast as possible to our eastern boundary, to ascertain if the Consols No. 5 have committed any encroachment.

No. 1 Shaft—Gold Report

1872.	oz.	dwt.	oz.	dwt.
Jan. 3 ...	24	1		
„ 5 ...	14	12		
„ 6 ...	10	18		
„ 9 ...	20	15		
„ 11 ...	15	2		
„ 13 ...	25	1		
„ 16 ...	25	1		
„ 18 ...	36	3		
„ 20 ...	20	8		
„ 23 ...	23	11		
„ 25 ...	37	5		
„ 27 ...	25	10		
„ 29 ...	28	3		
			306	10

No. 2 Shaft.

1871.	oz.	dwt.	oz.	dwt.
Dec. 28 ...	7	19		
1872.				
Jan. 11 ...	2	19		
„ 25 ...	12	12		
			23	10

LATER NEWS.—*Since this was written we have news by "Melbourne Argus" to 1st February. The Ballarat Correspondent of that paper states that the Winter's Freehold Company had a capital washing to-day (1st February) of close on 50 oz.*

Total yield since last returns, 330 oz.

Works stopped 1st and 2nd January for repairs, &c.

MARINERS' REEF QUARTZ MINING AND CRUSHING CO., REGISTERED, MARYBOROUGH.—During the past half-year, ending January 17, 1872, the cutting down of engine shaft has been pushed on as rapidly as possible. In the first place, considerable alterations were found necessary to the pumping gear and other surface works, and several parts of the machinery had to be strengthened and refixed. New poppet heads were also erected, capstan shifted, the brace of shaft raised, and sundry other improvements effected. Tenders were received for cutting down to the water level, or about 280 feet, at rates varying from 2*l.* 5*s.* to 3*l.* 12*s.* per foot, for labour only, and the lowest tender was accepted. Up to the present time 204 feet have been completed, since increased to 220 feet including timbering, &c., making the shaft 11 feet long by 4 feet 6 inches wide, with divisions for pumping, hauling, and ladder ways. The mining manager reports that the water level will be reached in about five weeks from this date, and he hopes after another six months' work to be raising sufficient stone to supply all the batteries of stamps. The rock passed through in cutting down to present level has been ordinary sandstone and slate, occasionally intersected by small veins of quartz, but presenting no features requiring special mention. The cross-cuts east and west from the No. 2 shaft have been advanced a considerable distance, the former 173 feet from the line of main reef, and the latter to 122 feet. In both directions several quartz leaders and spurs have been cut through, but nothing of a paying character has yet been seen, and should no change in the prospects occur soon, these operations will be suspended. The tributors on North Mariners' lode having apparently worked out the upper run of golden stone, they were subsidized to the extent of 10*s.* per foot for sinking deeper, and they are now down 163 feet, passing through stone showing gold but not in paying quantities. The men have, however, great confidence in the ground, and seem determined to continue the prospecting work as far as possible.

1st Feb., 1872.—As soon as the main shaft is down to 500 feet, the manager hopes to keep the batteries fully employed on the company's stone by driving a main level south along the reef, which would, it is thought, open up some rich ground in what is called the third reef, and from which some good prospects were obtained at the bottom of No. 3 shaft at less than 400 feet deep. This same run could not perhaps be cut in the shaft much under 700 feet. The mines north and south of our leases are about to be vigorously worked, and any discoveries they may happen to make would add value to this property.

NEW ZEALAND MINES.

Alburnia Gold Mining Company, New Zealand, December 20, 1871.—The manager has lodged 101 oz. 10 dwt. of gold, being the result of the late irregular crushing; specimens now going through at the Herald machine. *12th December*, 1871.—Some very good picked stone was taken out last night from the second stope back of the low level, and to-day some very nice gold is also showing in stopes of the main reef, on the low level, but near to the shaft. The winze is going down very dry beneath the present low level, and the reef at the bottom of it shows gold freely, and from this point to the junction of the specimen leader, where the best run of gold was found, is only 8 feet, so that the manager expects in a few days to touch it. The mine throughout looks remarkably well, and the only drawback to the realization of large yields is the deficiency of water for the mine, only seven heads going part of yesterday, and to-night again a further stoppage will take place, but after a short time the water race that was burnt down will be repaired, and the manager will be in a position, perhaps, to keep ten heads out of the twenty going. *5th December*, 1871.—The telegram of Saturday is perfectly correct, and an examination of the mine to-day shows that the short accounts furnished, from time to time, by the manager, are, on the whole, correct. On what is now considered the main low level, they have driven upon the specimen leader upwards of 125 feet. This is being followed by stopes towards the new winze, and here there is a fine run of gold, from whence we took some very rich stone, and the manager reports that a good candle-boxful was grassed yesterday. This gold corresponds with what was found, months ago, beneath, and is, no doubt, the upper portion of the run. On this leader they have fully 500 feet in their mine, and seeing that the El Dorado are getting such good yields from it, it must, of necessity, prove to be a splendid lode to the company, as the gold is being traced on one side of the main adit by the company, and on the other to the El Dorado boundary by the tributors. The main lode in the stopes, between the adit and the main level, is also turning out gold, some very good stone being picked down yesterday, and as the lode is fully 5 feet wide, it will be seen at a glance that very shortly, when water is sufficiently abundant to keep going the whole twenty heads, the yields from this mine will again be such as to place it among the foremost of our gold producers. It will be remembered by your readers that the very best of the gold ever obtained by the company in a winze (No. 1) on the junction of the main lode and specimen leader, which was down about 30 feet below the main low level, but in consequence of the inflow of water, this had to be filled up with mullock almost to the top, only allowing a little stoping to be carried on; but to get at this gold the manager sank another winze to the east of the lode, through clay, to drain No. 1, and this he has effectually done; consequently he resumed work in it yesterday, and found that the cause of the water was nothing more than the tapping of a new lode, hitherto unseen in the upper workings. The object he has had long at heart seems to be nigh at hand, for by sinking No. 1 winze he will get under the best ground of the main lode, also the specimen leader. A vast amount of dead work has been done during the alterations attending the machinery, but done in such a manner as will give the battery work for at least twelve months. For some ten days the battery has been running upon stuff that came out of the Star of the South, which paid crushing expenses, and on Friday evening started upon the Alburnia stuff, and up to last night about 150 oz. of amalgam was in hand, when the mill had to stop for water, a bush fire carrying away several hundred feet of the Moanatairi water supply fluming. A large quantity of crushing dirt is in paddock, besides from 3 to 4 cwt. of good specimens. *19th December*, 1871.—The Alburnia and Whau machines belonging to these companies have been brought to a standstill by the want of water. Cleaning up for the Alburnia will not be finished until to-morrow. *22nd December*, 1871.—The 400 lb. picked stuff yielded 58 oz. of gold.

Shotover Gold Mining Company, New Zealand, 16th December, 1871.—At a depth of 36 feet have cut a small leader coming in from the Long Drive side, being the first that has been seen since leaving the surface. *2nd December*, 1871.—For several days past a portion of the company's machine has been engaged in crushing a lot of mullock, which has been lying on the ground some length of time, and the result is, that 18 oz. retorted gold was banked to-day. The tributors are also cleaning up, but the result is not yet ascertained, the yield expected being about ¾ oz. to the ton. *9th Dec*, 1871.—Macgregor and party have crushed 30 lb. of specimens at Spencer's, and obtained 17 oz. 7 dwt. of melted gold. *23rd December*, 1871.—A small parcel of stone has yielded 17 oz. 5 dwt. *13th December*, 1871.—The lower strata, through which the main shaft is now passing, are composed of country of extraordinary consistency considering the great depth gained. Nothing so soft, so kindly looking, so suggestive of gold has been met with since the surface strata were passed through. That what I have stated is no exaggeration was proved by the headway made during last night's shift, when 2 feet all over the shaft were sunk. By Christmas the shaft will have been sunk to the required depth, well included, and at about the new year, the last level will be opened out. At this level (350 feet) three cross-cuts will be in from the shaft to the boundaries of the mine; one to intersect the main lode, another to prospect for the underlie of the Long Drive lode, which is expected to be met with near the boundary, and the third to prospect the country near the All Nations and Kuranui corner peg. Driving on the right-hand branch of the main lode is still being prosecuted at the 300 feet level, and the stone getting wears a very promising appearance. Some of it is now passing on trial through the battery. In a former report I stated that the underlie of the All Nations lode could be met with in the shaft about 340 feet. This was a mistake, begotten of an erroneous estimate of the angle of underlie. According to the true angle of dip, the shaft will not touch the lode at a much less depth than 600 feet. *9th December*, 1871.—I am glad that there is occasion to report a very marked improvement in the 300 feet level workings. Since I last reported on this section of the mine, the lode—or rather the left-hand branch of the lode, a horse having split it—has been followed 40 feet towards the Kuranui without good result. The manager then turned out and drove the horse to find the other branch, and the main foot-wall as well. The lode was touched the night before last, has been cut through, and is found to be composed of a fine body of good working stuff, containing plenty of mineral, copper especially. Mr. Hall is considerably elated by this favourable change, and proposes to at once break out and crush 15 or 20 tons on trial.

Golden Crown Gold Mining Company, New Zealand, December 16, 1871.—From 60 tons of quartz crushed from the Golden Crown 127½ oz. of gold were obtained. *December* 16, 1871.—Another week the company have been put to much inconvenience by the want of water, which has retarded the progress of crushing very much, not more than 50 tons having gone through for the company during the fortnight, and the result is 127 oz. 12 dwt. of melted gold, which includes the result from a lot of tailings treated at Tararu. Driving on both reefs in the low, or 170 feet level, is being vigorously carried ahead, and the manager reports that the whole of the stone now being broken out looks promising, and as soon as crushing power can be had, trials from this bottom level will be made. *December* 9, 1871.—During the past week very little stuff indeed has passed through the mill, in consequence of the Caledonian Company requiring all the water that is pumped from their mine, and hitherto this company (the Crown) have been partially supplied from that source. The tributors have put through 45 tons since their last clean up, which have been broken out from some of the upper blocks in the old reef, and the result is a fine yield of 67 oz. 6 dwt. of retorted gold. Another parcel of 69½ oz. was also lodged, being the balance of the gold obtained from a lot of 137 tons crushed at Tararu, which has yielded a total of 136½ oz., or an average of an ounce to the ton. This lot of stone is from the new reef in the stopes, between the 100 and 170 feet levels. Where they are now driving, in the 170 feet level, it is fully 7 feet wide, and a portion broken out between the two winzes will be milled next week, when this reef will then be tested at a lower depth than hitherto. The old reef, or No. 1 in this low level, is about 4 feet wide, but mixed with granite; in a few days a lot will also be tested from this, which is taken about 50 feet away from the Caledonian boundary. *December* 2, 1871.—During the fortnight which closes to-day, the 10 heads employed by the company have been irregular for want of water and other mishaps, so that not 60 tons have passed through, giving a yield of 67 oz. retorted gold, the whole of the stone crushed being from the stopes behind the No. 2 level on the old reef. With regard to the new low level, some days ago I recorded the intersecting of the new or No. 2 reef, but the width of it has not yet been ascertained, for after going into it 6 feet they commenced to drive inside the foot wall, and the character of the lode is such that hopes are entertained it will turn out well. The old reef is still being driven upon towards the Caledonian, but as the lode has not been taken down, very much cannot be said, but what little was broken out was satisfactory.

Golden Crown Tribute, December 23, 1871.—The fortnightly cleaning up produced 49 oz. 11 dwt. 12 gr. melted gold. *December* 6, 1871.—It is reported that a rich find has been made in the Manukau, in the Golden Crown, No. 2 reef.

Kuranui Gold Mining Company, New Zealand, 23rd December, 1871.—The return of gold for the last three weeks is 463 oz. 4 dwt. melted. The loss through melting was only 5 oz. 16 dwt. *December* 16, 1871.—The usual fortnightly cleaning up should have taken place yesterday, but in consequence of the Christmas holidays being so near at hand, Mr. Kernick has decided to postpone it until next Saturday. The general character of the stone that is now being crushed is from several veins near to the surface, and branching from the main lode, and the show is equal to those that have been current for the past month or six weeks. *December* 2, 1871.—The number of stampers engaged by the company during the past fortnight has varied from 20 to 25 heads as occasion required, and the result is still a gradual improvement upon what has been current for months past, no less than 250 oz. retorted gold being lodged, with 15 oz. or more to come in. The stone that has been crushed is from several veins that branch off from the main leader in the 10 and 20 fathom levels, and it is found to pay them much better than to work upon main lode. The whole force of the splendid battery is kept employed, and although several batteries are in want of stone, yet an offer for an engagement of ten heads for a twelvemonth, I heard, had to be put on one side.

The Tokatea Gold Mining Company, Coromandel, New Zealand, December 5, 1871.—This mine continues to send down large quantities of rich stone to the batteries. The drives and stopes throughout the mine are being worked energetically; large quantities of rich stuff being brought to grass daily. The low-level drive is being pushed forward rapidly. The manager expects to cut the leader early in the new year. Recent rich finds at low levels in the Bismarck and French Republic add tenfold to the value of this company's claim. A meeting of directors will be held on Friday next, at which a dividend will be declared. Over 200 tons were sent down during the week. Very rich stone is being taken out of the various stopes and drives throughout the

EXTRACTS FROM DICKER'S AUSTRALIAN AND LONDON GAZETTE.

workings. About 5 cwt. of rich specimens were taken out since Monday last, and the general stuff is better than usual. The drive on the new leader in the lower workings is being pushed forward towards the Royal Oak boundary with very good prospects. The low level tunnel is being pushed forward vigorously, and is now in over 150 feet.

December 12, 1871.—The New Zealand Company's battery is busily employed on the Tokatea stuff. The amalgam taken off the plates last week was retorted yesterday, and a return of 230 oz. gold obtained. The specimens on hand will be put through the one-stamper battery this week. The stuff being crushed is showing up better than usual; after a few hours run this morning, the plates were thickly covered with amalgam. This battery and the Whakaroa will be kept constantly employed until the Christmas holidays. The paddocks on the claim are quite full, and large quantities of stuff are being brought to grass daily.

December 21, 1871.—The New Zealand Company's battery has been kept fully employed on the Tokatea stuff. The amalgam taken off the plates last week was retorted on Monday, and gave a return of 214 oz. gold. The specimens will not be sent to the one-stamper battery until to-morrow. A general cleaning up will take place on Saturday, previous to the battery being closed for the Christmas holidays. The gold from both batteries will be lodged in the bank on Saturday. A total return to date of 1000 oz. is expected.

The Imperial Crown Gold Mining Company, New Zealand, 20th December, 1871.—The tributors on the Golden Hill leaders have crushed their specimens, and got about 100 oz. The general stuff is not finished. *18th December*, 1871.—The tributors on that part of this company's ground, known as the Golden Hill, have had one or two paying crushings from various leaders, but the one now being made at the Herald machine is about to surpass all of them. The leader is a small one, and was found by a cross-cut that was driven between the 40 feet level and the main adit, and appears to be a branch from Mulligan's or one of the large reefs that exist in the ground. Be that as it may, upwards of 2 cwt. of specimens are in hand, which will go through the Kuranui single-stamper to-morrow, and swell the yield of the general stuff considerably. *21st December*, 1871.—The exact weight of gold lodged by the tributors from the Golden Hill leader is 105¼ oz., from specimens alone. The crushing of the general stuff is not yet finished. *12th December*, 1871.—Mr. Briton, the successful contractor for the erection of this company's powerful battery of 40 stampers, signed the necessary documents to-day, and gave the requisite bonds, and will at once proceed to make a start. The reclaiming of the foreshore for the site has been a long and expensive job, the first contractors throwing it up; but now that it is almost finished, it presents a site that cannot be surpassed for its central position. This is only the beginning of a string of batteries along the shore, and in a few years such a thing as a mill far up the creeks will be unknown, as the scarcity of water, by the cutting down of timber, is beginning to be felt more and more every season. *21st December*, 1871.—The Golden Hill tributors have not yet finished cleaning up. The yield of the 200lb. of specimens was 105 oz. 19 dwt., which amount is likely to be augmented by 20 oz. or 30 oz. of gold from the 20 tons of general stuff crushed. *22nd December*, 1871.—The amalgam for the general stuff was retorted this morning, and produced 45 oz. of gold. Hence the yield of the 20 tons, including specimens, is 146 oz. 12 dwt.

Caledonian Gold Mining Company, New Zealand, 12th December, 1871.—The retorting is finished, and the gold lodged. The weight 3300 oz. The gold when melted was reduced to 3274 oz. 16 dwt. *23rd December*, 1871.—At last gold has been seen at the bottom level, where the main lode is being broken down between the crosscut and Tookey's boundary. In my last report I informed you that the lode there looked hungry and poor; well, since then it has undergone a change for the better; more metal, but no antimony, is coming in, and with a little gold. The show is nothing to boast about yet, only two or three small spots having been seen, but this fact, although a meagre one, is encouraging, as it denotes a continuation of gold downwards. I do not think that this gold has any connection with the main shot, but rather is the extension of a small streak of the metal that was found yesterday in the block between No. 3 winze and the shaft. But if that streak has reached the bottom level, probabilities are in favour of the main shot being found there likewise. It may not be either large or rich, and I think that, having changed its course—for change its course it must, if the gold is to pass through the bottom level—it is likely to run poor for a while, but so long as it does continue, the hope—the probability—of an improvement will be maintained. Besides looking better so far as the character of its stone is concerned, the lode seems inclined to widen out in the bottom level. If the main shot is there, it should be close at hand, say, within five or six feet of the face of the stope. 279 oz. of retorted gold, the produce of stuff washed by thirty-five heads of stampers at the Tararu machine, during the week, were banked to-day. The batteries of the company's machine will not be cleaned up until next week.

Albion Company, New Zealand, Kelly's Tribute, 22nd December, 1871.—At last a paying crushing has been obtained out of the main leader at the level of the bottom tunnel, and it is thought that the long-lost shot of gold from above has been picked up. The tributors broke out and crushed 24 tons, and obtained 35 oz. of gold.

Tookey's Company, New Zealand, 2nd December, 1871.—Wood's Tribute Company have crushed 9 tons at the Waiotaki machine, the result being 125 oz. 1 dwt. of gold.

VICTORIAN MINES.

(*Continued from page* 1.)

have all the runs of stone to work that the Victoria Gold Mines Company has been working. The stone in our present level has shown a decided improvement within the last two days, and I hope, when we have the present level fairly opened out, though our stope is only 40 feet, that we shall have some good returns, as we cut a very good run of gold in sinking the winze. We have also commenced a crosscut to the east to cut the old Hercules reef, and, should we cut it at the level, shall have a great height of stopes to work. I should recommend the shaft to be sunk another 50 feet after the present 50 is completed, if the water is not too heavy. Then you would have a good chance of cutting the western spurs worked to such advantage by the Victoria Gold Mines Company. *Jan.* 29.—Since my last report we have continued driving the levels north and south: the stone in former one is looking a great deal better, and I think our returns will improve. The contractors have sunk a further depth of 8 feet, and next week will do more, as they intend working three shifts. The yield for the past fortnight is 120 oz.

COLLMAN & TACCHI'S CO., BENDIGO.—*Jan.* 12.—*Director's Report.*—In again presenting our half-yearly report, we are gratified in being able to lay before you only a record of prosperity. Since our last balance two dividends, amounting to 1800*l.*, have been declared; the purchase and erection of a new winding plant has been satisfactorily completed, and the upper portion of the shaft enlarged and re-timbered. We are now in a position, if necessary, to sink a further depth of 500 feet, without any addition to the power now at our disposal. The present depth of the shaft is 750 feet, and at 720, or No. 13 level, the reef, averaging 4 feet in thickness, has been followed 130 feet, and proved to be payable throughout; this is the greatest distance we have yet traced it without a break. We have 50 feet of stopes yet to work. A considerable quantity of good stone is still to be had at No. 5 level, and the spurs on the back of No. 12 still maintain their payable character, and have proved of much greater magnitude than was anticipated. In consequence of the time necessarily lost in cutting down and re-timbering the shaft, and during the erection of the new machinery, we have not crushed so much stone as we did during the previous half-year; the return of gold, however, has been almost equal; while the average yield per ton shows a vast improvement. 1578 loads of stone have been crushed, yielding 1576 oz. of gold, or an average of almost 1 oz. per ton; whilst the average yield of a previous half-year only reached 14 dwt. 18 gr. From the amount of stone of a paying character which we have now to operate upon, and the improved means we now have of raising it, we feel satisfied that our efforts will be more successful than they have been, and that the declaration of dividends will shortly become a regular occurrence. *Jan.* 29.—The cleaning off on the 13th instant resulted in a yield of 282 oz. 11 dwt., that on the 20th 113 oz., exclusive of 38 oz. 13 dwt., the produce of the crushing of 29 tons pyrites. We have been stoping the extreme ends of the reef, to render the working of the whole more complete, otherwise the yield would have been greater. The No. 13 level has been extended 10 feet during the fortnight; total distance on the course of the reef, 140 feet; the stone averages 2 feet in thickness, and there is no indication of its running out; the water in the face is as strong as ever. The spurs in the back of No. 12 level continue payable. A run of spurs 20 feet lower has been struck, showing well for gold. The machinery is in good order.

VICTORIA REEF GOLD MINES COMPANY.—*Jan.* 15.—We have crushed for past fortnight 446 loads, yielding 415 oz. 3 dwt. The western crosscut at the 380-feet level has been driven 6 feet. We have also resumed driving crosscut at the 480-feet level; total depth of shaft 550 feet. A shilling dividend has been declared, payable on Tuesday, leaving a large credit balance to company. *Jan.* 29.—During the fortnight the shaft has been sunk 3 feet, making a total depth of 553 feet. The eastern crosscut, at the 480-feet level, has been driven 5 feet—total, 135 feet. We have also driven the western crosscut at the 380-feet level an extra 5 feet, making a total of 56 feet 6 inches. We have crushed 481 loads, yielding 390 oz. of gold. The ground throughout the mine still looks well. A dividend of 1*s.* per share has been declared, payable on Wednesday, 31st instant. Victoria Reef Gold Mines are still well supported in the market; the mine prospects are said to be better than ever; at the present time they can raise more stone than they can crush with their own batteries.

ENERGETIC, LAURISTON.—*December* 27.—Cleaned up on Saturday, and had from our own machine 72 oz. Nearly all the stone crushed was taken from the top levels, the mining manager being able to get only a very few tons from the lower level, where the best gold is to be seen. The company have sunk the shaft a further depth, and are now driving for the reef, which they expect to strike in a few days.

CENTRAL ENERGETIC, LAURISTON.—*December* 27.—Cleaned up on Saturday last, and had from our own machine 116 oz. The stone is much improved during the last few days. *December* 22.—Since last washing off nothing has been done in the way of raising stone. Have kept on a few hands to fill ground and raise passes. The poppet heads and brace will be finished in a couple of days.

SOUTH NEW MOON COMPANY, BENDIGO.—*January* 10, 1872.—Since last report the south level has been driven a further distance of 15 feet, making a total of 100 feet from crosscut; this brings it under the new shaft, which is now down within 25 feet of the level. During the fortnight two new spurs have been cut, both showing very nice gold, particularly the one cut to-day in the shaft.

THE NEW MOON COMPANY, BENDIGO.—*December* 9.—Winding machinery is working well, and the mine looks promising.

HOPE, WOOD'S POINT,—*December* 23.—Yield for the fortnight, 137 oz. of retorted gold, of which 117 oz. 3 dwt. is from 258 tons of quartz, and 19 oz. 17 dwt. from pyrites. There is no change in the appearance of the mine. Preparations are being made to resume sinking the main shaft; baling will be commenced immediately after the New Year holidays. The surface reef tributors are pushing on with their preliminary work, and expect to commence crushing in a fortnight. *January* 15.—The time occupied in getting the water out of the new shaft was longer than anticipated. When within 20 feet of the bottom the pressure became very great, and it was only lowered 18 inches in two days. It is now under control, and will be drained sufficiently to permit sinking being resumed to-morrow. The 300 feet level has been extended 3½ feet in the week. Reef nearly 2 feet thick; no change in the stone. The stoping contract on the Hope Reef has been thrown up, and we are at present carrying on with wages men. One battery is crushing for surface reef tributors. *January* 27.—The directors' report showed that 1956 oz. 11 dwt. gold had been obtained during the half-year; that dividends of 4*s.* 6*d.* a share (2700*l.*) had been paid in the same period. The new shaft had been sunk to a depth of 98 feet. The report of the superintendent and mining manager showed the position and prospects of the mine to be favourable. The accounts and reports were adopted, and the directors elected for the ensuing twelve months. *January* 29.—The new shaft has been sunk 3 feet in the week. The depth is now 102 feet below the tunnel. No alteration in the country, and the quantity of water about the same. More coarse gold has been seen during the past week in the Hope reef. A quantity of stone has been broken from the new reef below the 300 feet level and at the tunnel, which also shows coarse gold. The 300 feet level has advanced 4 feet in the week. The reef has become small again, and has not otherwise improved.

London: Printed by HEAD, HOLE & Co., 11 to 13, Harp Alley, Farringdon Street, and Ivy Lane, Paternoster Row, E.C., for RICHARD MIDDLETON and HENRY ENGLISH (the proprietors), at their office, 26, Fleet Street, E.C., where all communications are requested to be addressed.—Saturday, March 30, 1872.